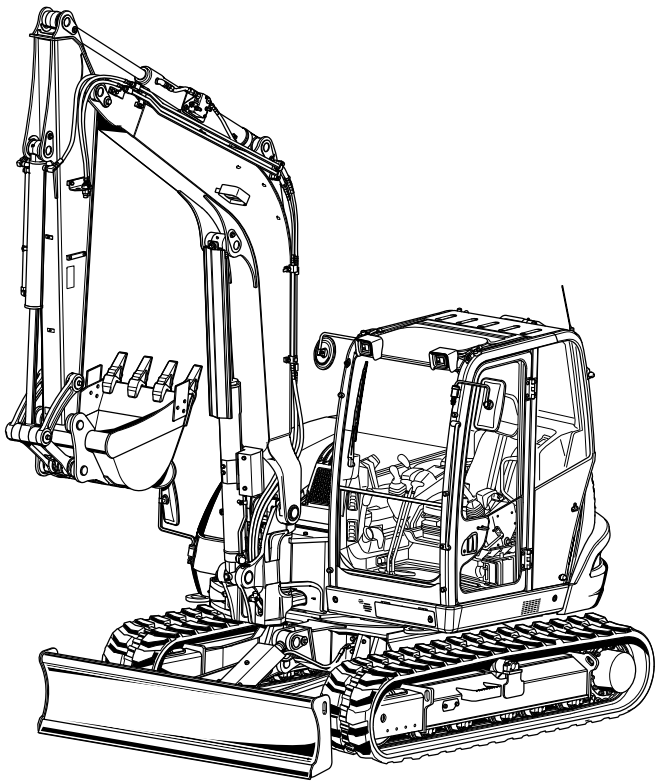
Kubota

EXCAVATOR

GB

MODEL

KX085-5



OPERATING INSTRUCTIONS

W9297-8135-2 - Original - 12/2023

Kubota

Dear valued customer,

please fill in the form below. Your information will help us to help you.

Type:
Year of construction:
Product identification number:
Shipment date:

These operating instructions only apply to the KUBOTA excavator KX085-5, which complies with the following Declaration of Conformity (page 11).
In addition, the machine's product identification number must correspond to the following scope of application.

KX085-5 - Valid from serial number 11489

The serial number is part of the product identification number (page 50).

Please contact your KUBOTA dealer for any additional information or troubleshooting procedures not mentioned in these operating instructions.

We would also like to point out that the contents of these operating instructions are not part of any previously existing agreement, commitment or legal relationship nor do they constitute an amendment this. All responsibilities are taken from the respective sales contract, which contains the complete and exclusively valid contractual warranty, refer to the "Duties, liability and warranty" section (page 17). This documentation neither extends nor restricts the contractual warranty.

KUBOTA Baumaschinen GmbH reserves the right to change the information contained in this document with respect to future technical development without altering the basic characteristics of the machines described herein and without amending this document.

CONTENTS

Abbreviations

1/min	revolutions per minute
%	percent
°	degrees
°C	Degrees Celsius
A	Ampere
acc.	according
API	American Petroleum Institute
approx.	approximately
ASTM	American Society for Testing and Materials
bar	Bar
CECE	Committee for European Construction Equipment
CO_2	carbon dioxide
dB	decibel
DIN	Deutsches Institut für Normung (German Institute for Standards)
DPF	Diesel particulate filter
e.g.	for example
EGR	Exhaust Gas Recirculation
EMC	electromagnetic compatibility
EN	Europäische Norm (European standard)
GL	Ground level
h	Hour
incl.	including
ISO	International Organisation for Standardisation
kg	kilogramme
km/h	kilometre per hour
kN	kilonewton
kV	kilovolt
kW	kilowatt
l	litre
l/min	litres per minute
LpA	noise level operator's place
LwA	sound power level
m	metre
m/s^2	metre per square second
m^3	cubic metre
max.	maximum
MIL	Military Standards
mm	millimetre
MPa	Megapascal
N	Newton
NRSC	Non-Road Steady-State Cycle (Stationary check cycle for mobile machines not intended for use on roads)
NRTC	Non-Road Transient Cycle (Dynamic check cycle for mobile machines not intended for use on roads)
OPG	Operator Protective Guard
resp.	respectively
RMS	Root Mean Square
ROPS	Roll-Over Protective Structure
s	second
SAE	Society of Automotive Engineers (Verband der Automobilingenieure)
t	ton
TOPS	Tipping-Over Protective Structure
V	Volt

General symbols


Warning light


Fuel indicator


Engine oil pressure indicator


Charge indicator


Glow indicator


Hydraulic oil


Fast speed


Slow speed


Forward travel


Backward travel


Raise boom


Lower boom


Arm dump


Arm crowd


Bucket crowd


Bucket dump


Coolant temperature indicator


Service interval indicator


Swivel boom (left)


Swivel boom (right)


Dozer up


Dozer down


Control lever direction


Control lever direction


Beacon

Auxiliary port enable switch


Working lights

AUTO IDLE switch

AUTO IDLE indicator

Engine auto-stop indicator


Fan


Menu switch


Overload warning switch


Information


Set clock indicator


Overvoltage indicator

	Anti-theft system fault indicator
	Insert key indicator
	Pull out key indicator
	Lower control lever lock indicator
	Auxiliary port indicator
	Horn
	Please read the operating manual
	Wiper switch
	Washer switch
	Diesel fuel
	Lock
	Unlock
	Engine stop display
	Particle filter regeneration
	Increase engine speed
	Particle filter regeneration locked

	Dozer in floating position
	Overload warning indicator
	Raise control lever lock indicator
	Start engine indicator
	Controller Area Network indicator
	Return switch
	Acknowledge
	Cancel
	Water separator filter
	Seatbelt indicator
	Hydraulic oil temperature indicator
	Log record
	Language setup
	Display brightness
	Work light turn-off delay
	Camera

GENERAL INFORMATION

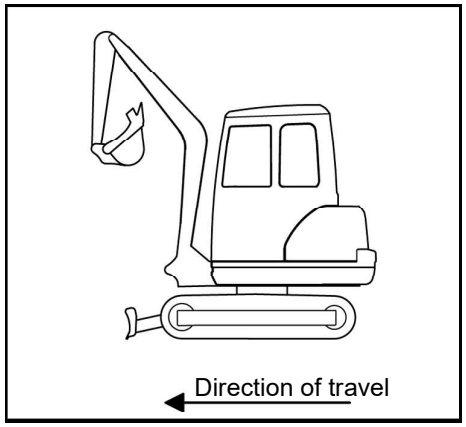
Foreword

Safety instructions, the rules and regulations for the use of machines given in these operating instructions apply to the machines mentioned in this documentation.

It is the responsibility of the owner(s):

- to ensure that local, regional and national regulations are observed,
- to observe the bodies of rules (laws, regulations, guidelines, etc.) stated in the operating instructions to ensure safe handling of the equipment,
- to ensure that the operating instructions are available to the operating personnel at all times and that the information, such as notes, warnings and safety rules and regulations, are followed in all points.

The terms "front" and "direction of travel" refer to the view of the operator when seated on the operator's seat. Forward direction of travel means that the dozer is at the front when driving forwards as shown in the figure.



The symbols for operating and safety instructions are listed under "Safety symbols" (page 18).

Declaration of Conformity

A copy of the Declaration of Conformity is issued for the European Union economic area and for the United Kingdom, and is supplied with the machine accordingly.

Keep the Declaration of Conformity in a safe place and show it, if requested, to the responsible authorities. If the Declaration of Conformity is lost, the operator must request a replacement copy from the KUBOTA dealer.

The CE and UKCA conformity markings are located on the type plate. If the machine is modified or retrofitted without the approval of the manufacturer, the safety of the machine may be affected, thus rendering the Declaration of Conformity invalid.

Content of the EC Declaration of Conformity:

ORIGINAL EC DECLARATION OF CONFORMITY

Manufacturer:	**KUBOTA CORPORATION**
Trade name:	**KUBOTA**
Type:	**Excavator**
Model:	**KX085-5**
Product identification number:	>XXXXXXXXXXXXXXXXX<

This machine fulfills all the relevant provisions of the Machinery Directive 2006/42/EC

This machine fulfills all the relevant provisions of the directives and regulations: 2000/14/EC, 2014/30/EU

Conformity assessment according to the directive 2000/14/EC, annex VI.

Model	Rated speed	Nominal output (ISO 14396)	Measured sound power level	Guaranteed sound power level
KX085-5	2000 1/min	49.0 kW	95.4 dB (A)	96 dB (A)

Referred standards:	EN 474-1:2006+A6:2019 except Annex G, EN 474-5:2006+A3:2013
Notified body:	TÜV SÜD Industrie Service GmbH (Notified Body 0036 for EC Directive 2000/14/EC) Westendstrasse 199, D-80686 Munich, Germany
Name and address of the manufacturer:	KUBOTA CORPORATION 1-1-1, NAKAMIYA OIKE HIRAKATA OSAKA, 573-8573, JAPAN
Name and address of the authorised representative:	KUBOTA Baumaschinen GmbH Steinhauser Str. 100 D-66482 Zweibrücken, Germany
Name and address of the person authorised to compile the technical file:	KUBOTA Baumaschinen GmbH Steinhauser Str. 100 D-66482 Zweibrücken, Germany

Economic operator of the product (based on the Regulation (EU) 2019/1020)
Name: Kubota Holdings Europe B.V.
Contact details: Hoofdweg 1264, 2153 LR Nieuw-Vennep, the Netherlands
Email: kbt_g.eu_market_surveillance@kubota.com

Content of the UK Declaration of Conformity:

ORIGINAL UK DECLARATION OF CONFORMITY

Manufacturer:	**KUBOTA CORPORATION**
Trade name:	**KUBOTA**
Type:	**Excavator**
Model:	**KX085-5**
Product identification number:	>XXXXXXXXXXXXXXXXX<

This machine fulfills all the relevant provisions of the Supply of Machinery (Safety) Regulations 2008 (UK S.I. 2008 No. 1597)

This machine fulfills all the relevant provisions of the directives and regulations:
Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (UK S.I. 2001 No. 1701), Electromagnetic Compatibility Regulations 2016 (UK S.I. 2016 No. 1091)

Conformity assessment according to the directive Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001, Schedule 9.

Model	Rated speed	Nominal output (ISO 14396)	Measured sound power level	Guaranteed sound power level
KX085-5	2000 1/min	49.0 kW	95.4 dB (A)	96 dB (A)

Referred standards:	BS EN 474-1:2006+A6:2019 except Annex G, BS EN 474-5:2006+A3:2013
Approved body:	TUV SUD BABT (Approved Body 0168 for the Regulation UK S.I. 2001 No. 1701) Octagon House, Concorde Way, Segensworth Fareham, Hampshire, PO15 5RL, U.K.
Name and address of the manufacturer:	KUBOTA CORPORATION 1-1-1, NAKAMIYA OIKE HIRAKATA OSAKA, 573-8573, JAPAN
Name and address of the authorised representative:	KUBOTA (U.K.) LTD. Dormer Road, Thame Oxfordshire, OX9 3UN, U.K.
Name and address of the person authorised to compile the technical file:	KUBOTA CORPORATION 1-1-1, NAKAMIYA OIKE HIRAKATA OSAKA, 573-8573, JAPAN

Declaration of Conformity: radio equipment manufacturer

Hereby, ASAHI DENSO CO., LTD. declares that the radio equipment type [CZ106] is in compliance with the directives of the following economic areas:

- European Union: 2014/53/EU
- United Kingdom: The Radio Equipment Regulation 2017 (S.I. 2017/1206)

The full text of the respective Declaration of Conformity is available at the following internet address:
http://en.ad-asahidenso.co.jp/euro-compliance/

Date of issue of the operating instructions

The date of issue of the operating instructions is printed on the bottom right of the front page of the book.

Operating personnel

The duties of personnel with respect to operation, servicing, repairs and safety inspections must be clearly defined by the owner.

Personnel in training are only allowed to work on or with the machine under the supervision of an experienced operator.

Operator

According to industrial safety regulations, only persons who were instructed in the operation of the machine, who have proven their qualification to the owner (employer) and who can be expected to perform their duties in a reliable way are allowed to operate the machine independently.

Only instructed personnel are allowed to start the machine and operate the controls.

Trained personnel

Trained personnel are skilled persons with a technical qualification who are able to determine damage to the machine and perform repairs in their area of qualification (e.g. hydraulic or electrical engineering).

Only trained and instructed personnel are allowed to work on the machine.

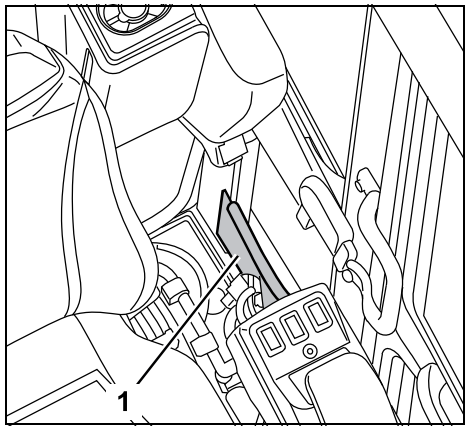
Qualified personnel

Based on their technical training and experience in their field, qualified personnel should have sufficient knowledge about the technology used in this machine and be familiar with the applicable national work safety regulations, accident prevention regulations and the generally accepted technical rules so that they can assess the sound operating condition of the machine.

Location of the operating instructions

The operating instructions must always be kept on the machine. If the operating instructions have become illegible due to continuous use, the owner (operator) must order a replacement from the KUBOTA dealer.

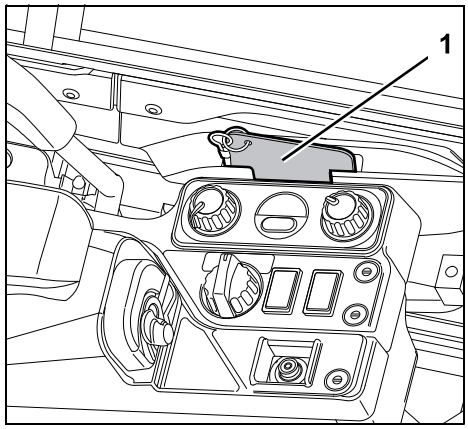
The storage location (1) for the operating instructions is on the left side of the driver's seat.



Location of the quick instruction manual

The quick instruction manual describes the first steps for operating the machine. This enables the basic functions of the machine to be operated in the short term. The quick instruction manual is not a substitute for the operating instructions. If the operating instructions have become illegible due to continuous use, the owner (operator) must order a replacement from the KUBOTA dealer.

The storage location (1) for the quick instruction manual is on the right side of the driver's seat.



Spare parts

When ordering spare parts, please always provide the following information:

- Machine’s product identification number and year of construction (see type plate)
- Designation/type of spare part (see original KUBOTA spare parts catalogue)
- Part number of the spare part (see original KUBOTA spare parts catalogue)
- Quantity
- Customer number

For written orders, please provide this information exactly, or for telephone orders, please have this information ready before calling. This makes the process easier for us and for you, and prevents errors and incorrect orders or deliveries.

Please place your order with your KUBOTA dealer.

SAFETY RULES

Basic safety instructions

- The EC Use of Work Equipment Directive (2009/104/EC) from 16/09/2009 applies to the operation of the aforementioned machine.
- The information in these operating instructions applies for maintenance and repairs.
- National rules and regulations apply where applicable.

Duties, liability and warranty

A basic prerequisite for the safe handling and problem-free operation of the machine is the knowledge of the safety instructions and safety regulations.

These operating instructions, in particular the safety instructions, must be followed by all persons working near or with the machine. Above and beyond this, the safety rules and regulations applicable for the site must also be observed.

Hazards occurring during the handling of the machine:

- The machine has been manufactured according to the state of technology and the recognised safety rules. Nevertheless, danger to life and limb of the operator or a third party, or damage to the machine or other property, can occur. The machine(s) may be used only

  → for its approved use and

  → in a completely safe operating condition.

  Malfunctions that can impair safety must be repaired immediately.

Warranty and liability

The scope, period and form of the warranty are set forth in the sales and delivery conditions of the manufacturer. The operating instructions valid at the time of delivery shall be the basis for any warranty claims arising from errors in the documentation, see the date of issue of the operating instructions (page 14). The following applies above and beyond the sales and delivery conditions: No warranty or liability shall be assumed for personnel and property damages resulting from one or more of the following reasons:

- unapproved use of the machine
- improper starting, operation and maintenance of the machine
- operation of the machine with malfunctioning safety devices or improperly installed or non-operational safety and protective devices
- ignorance or non-observance of these operating instructions
- insufficiently qualified or insufficiently instructed operating personnel
- improperly performed repairs
- unauthorised engineering changes to the machine
- poor surveillance of machine parts subject to wear
- catastrophes caused by the effect of foreign objects or an act of God

The owner must ensure at his or her own responsibility that

- the safety rules are observed (page 17)
- unapproved use (page 19) and unauthorised operation are prevented
- the approved used (page 19) is ensured and the machine is operated in accordance with the contractual conditions of use.

Safety symbols

The following terms and hazard symbols are used in these operating instructions:

Identifies important operating procedure information that may not be immediately evident to the operator.

Identifies operating procedures that must be followed exactly to prevent damage to the machine or other property.

Identifies operating procedures that must be followed exactly to prevent danger to persons.

Identifies possible hazards in the handling of batteries.

Identifies possible hazards from caustic materials (battery acid).

Identifies possible hazards from explosive materials.

Prohibits the use of fire, ignition sources, and smoking.

Prohibits the spraying of water.

Identifies operating procedures for the proper disposal and storage of ensuing waste materials.

Approved use

The machine specified in these operating instructions may be used only for loosening the ground, excavating, picking up, handling and dumping of soil, rocks and other materials, as well as working with a dozer or hydraulic hammer. The load may be transported largely without driving the machine. Do not exceed the maximum lifting capacity.

Approved use also includes:

- Observation of all notes in these operating instructions
- Regular servicing
- Regular safety inspections

Unapproved use

Any improper use—i.e., any deviation from the information in the "Approved use" section (page 19) of the machine documented in these operating instructions—is considered an unapproved use. This also applies to the failure to observe the standards and guidelines listed in these operating instructions.

Hazards can occur as a result of improper use. Such improper uses include:

- Using the machine to lift loads without proper equipment for lifting operations
- Using the machine while the operator is not in the driver’s seat
- Using the machine in contaminated environments
- Using the machine in explosive environments
- Using the machine in enclosed spaces without sufficient ventilation
- Using the machine in extreme temperatures (extreme heat or cold)
- Using the machine during a thunderstorm or when there is a possibility of lightning
- Using the machine for underground work
- Using the machine to transport people (e.g., on attachments)
- Using the machine for demolition work where there is a danger of falling objects (e.g., tearing down walls)
- Using the machine with a log grab

Restrictions with regard to quick couplers and attachments

The KUBOTA excavator was extensively tested to ensure that it functions properly with the quick couplers and attachments sold or approved by KUBOTA.

Using quick couplers or attachments that were not sold or approved by KUBOTA or that are not suited for use with the KUBOTA excavator in some other way can cause damage to the excavator and to other property. Furthermore, they pose a risk of injury to the operator and other people.

[Damages caused to the excavator as a result of using unsuitable quick couplers or attachments are not covered by the warranty.]

Special duties of the owner

Owner of the machine in the sense of these operating instructions is any person or company that uses the machine itself or on whose order it is used. In special cases (e.g. leasing, rental), the owner is the person who must perform the duties arising from operation according to the conditions of the contract between owner and user of the machine.

The owner must ensure that the machine is only used properly and that any danger to the life and health of the user or others who are in the proximity of the user are eliminated. Furthermore, observance of the safety rules and regulations as well as the operating, maintenance and repair regulations must be ensured. The owner must make sure that all operators and users have read and understood these operating instructions.

Persons who work with or on the machine must be provided by the operator with, and where applicable use suitable personal protective equipment (PPE), for example: suitable working clothes, safety shoes, safety helmets, eye protection, ear protection and air-filter masks. The owner/employer bears the main responsibility for the PPE, which is specified by the safety rules for particular types of activity.

Waste such as old oil, fuel, hydraulic fluid, coolant and batteries comes under the category of toxic waste and can be a hazard to the environment, people and animals.

Disposal must be undertaken in an appropriate way, according to legally prescribed pollution control and safety regulations.

If you have questions about the proper disposal or storage of refuse and toxic waste, contact your KUBOTA dealer or a local waste management contractor.

Noise emission and vibration

The values specified in these operating instructions were identified during the test cycle on an identical machine and are valid for a machine with the standard equipment. The determined values are shown in the Technical Data (page 48).

Noise emission

The noise levels were determined using the method for determining the guaranteed sound pressure level of ISO 4871 based on the following directives:

- European Union: 2000/14/EC Appendix VI
- United Kingdom: Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001 (S.I. 2001/1701)

The noise levels indicated are not applicable for the determination of additional workplace noise emissions. The actual noise levels may need to be determined directly at the workplaces, subject to actually existing conditions (other noise sources, special operating conditions, sound reflections).

Depending on the actual noise emissions, the owner must provide the operator with the necessary personal protective equipment (ear protection).

Noises at a noise level of more than 85 dB (A) can cause hearing damage.
At a noise level of 80 dB (A) and up, the use of ear protection is recommended.
At a noise level of 85 dB (A) and up, the operator must wear ear protection.

Vibrations

The vibrations on the machine have been determined using an identical machine.

The vibration stress on the operator over a longer period of time must be determined by the owner at the operating site, in compliance with the following directives in order to consider individual magnitudes of influence:

- European Union: 2002/44/EC
- United Kingdom: The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007 (S.I. 2007/3077)

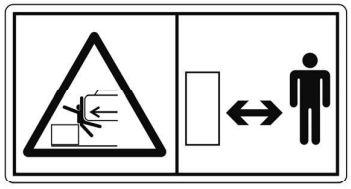
Safety labels on the machine

Care of safety labels

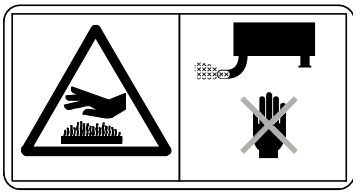
- Keep safety labels clean and free from interfering objects.
- Clean safety labels with soap and water and dry with a soft, clean cloth.
- Replace damaged or missing safety labels with new ones from your KUBOTA dealer.
- If a component with glued-on safety labels is replaced with a new part, make sure that the new labels are affixed to the same location as the replaced component.
- Safety labels should be stuck only on clean and dry surfaces. Press any air bubbles into the outer edge of the sticker.

The positioning of the safety labels is illustrated in the following figures.

1) Code #: RC788-5727-0
Mortal danger by crushing!
Low safe distance to the excavator and to obstacles can prevent an emergency exit from the danger zone. Crushing by excavator results in severe injury or death.
- Do not enter the manoeuvring area.
- Ensure safe distance to obstacles and sufficient freedom of movement.

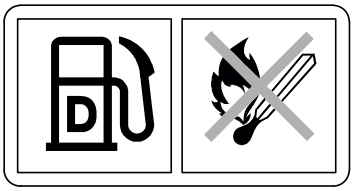


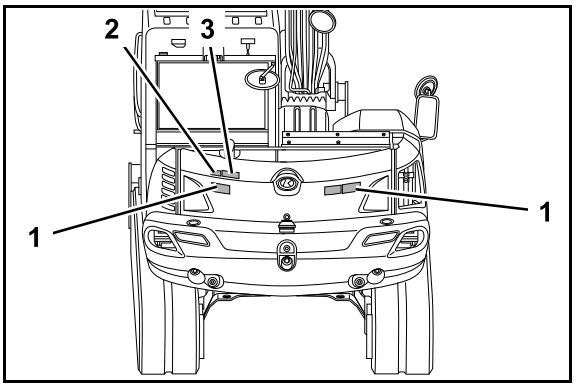
2) Code #: RD579-5725-0
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot parts, such as exhaust muffler, etc.

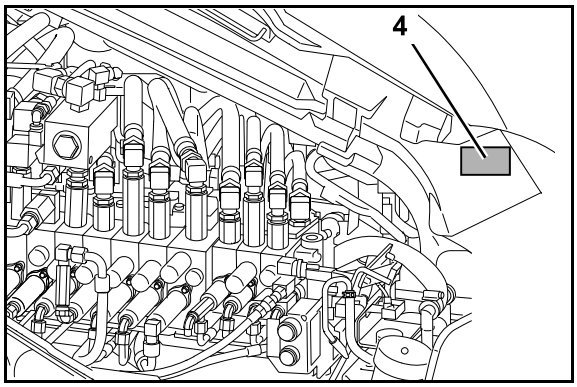


3) Code #: RD458-5738-0
Risk of being crushed or cut by rotating components!
The rotating fan can cut into limbs and the rotary belt drive can pull in limbs and crush them.
- Switch off the engine before working in the engine compartment.
- Make sure that the engine and all engine components have come to a complete standstill.
- Do not reach into rotating components.

4) Code #: RD859-5736-0
Risk of fire from inflammable diesel fuel!
Inflammatory vapours can occur in the fuel tank, which may go up in flames as a result of an ignition source.
- Do not use open flames in the vicinity of the fuel tank.







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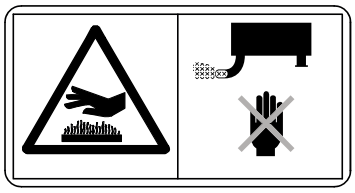
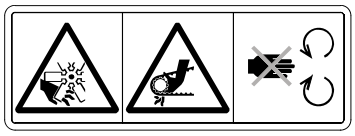
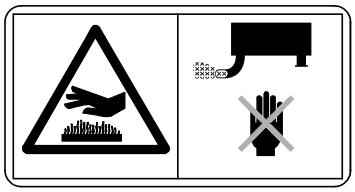
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot parts, such as exhaust muffler, etc.



2) Code #: RD859-5778-0
Risk of being crushed or cut by rotating components!
The rotating fan can cut into limbs and the rotary belt drive can pull in limbs and crush them.
- Switch off the engine before working in the engine compartment.
- Make sure that the engine and all engine components have come to a complete standstill.
- Do not reach into rotating components.

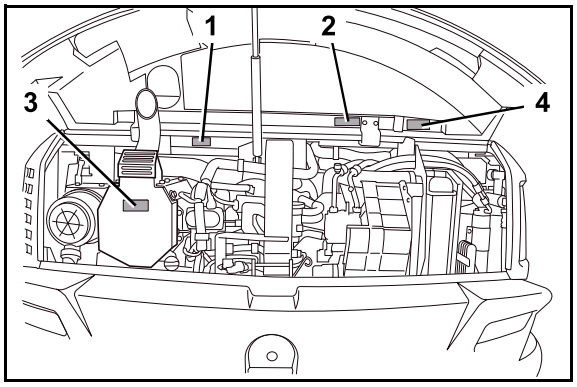


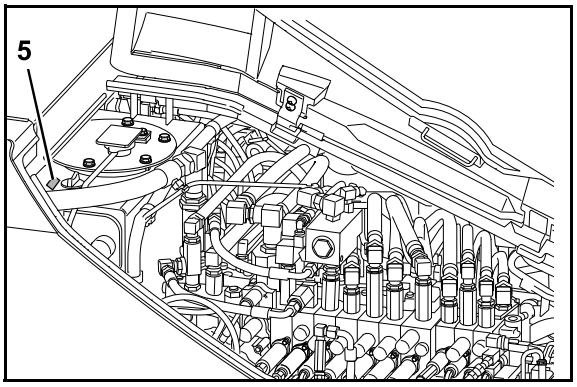
3) Code #: RD579-5745-0
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot parts, such as exhaust muffler, etc.



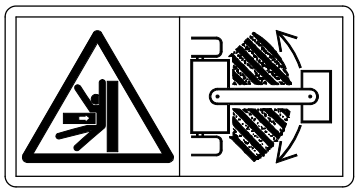
4) Code #: RD579-5754-0
Risk of scalding from hot coolant!
The coolant may leak suddenly when opening the cap of a hot radiator, posing a risk of scalding your face and hands.
- Do not open the hot radiator.
- Allow the machine to cool down before working on the cooling circuit.

5) Code #: RD579-5754-0
Danger of injury from liquids under pressure!
Hydraulic oil can squirt out when opening the hydraulic oil tank. Escaping hydraulic oil under pressure can penetrate into the skin.
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not cover apertures, e.g. ventilation systems, and hot components with hands.
- Do not open the cover of the hydraulic oil tank while it is hot.

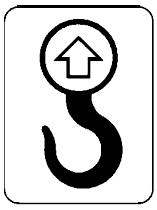




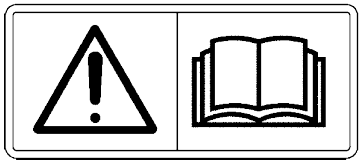
1) Code #: RB456-5722-0
Mortal danger by crushing!
A low safe distance to the boom can impede an emergency exit from the danger zone. Being crushed by the boom can result in severe injury or death.
- Do not stay in the swing area of the boom.
- Ensure safe distance to obstacles and sufficient freedom of movement.



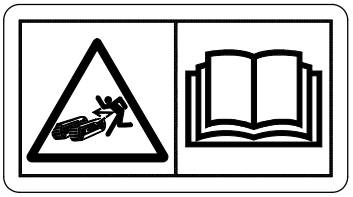
2) Code #: RC108-5796-0
Lifting point

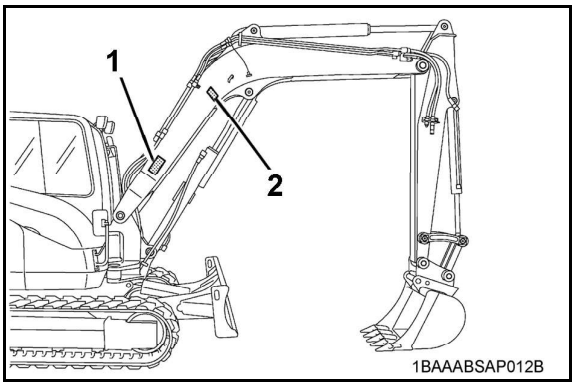


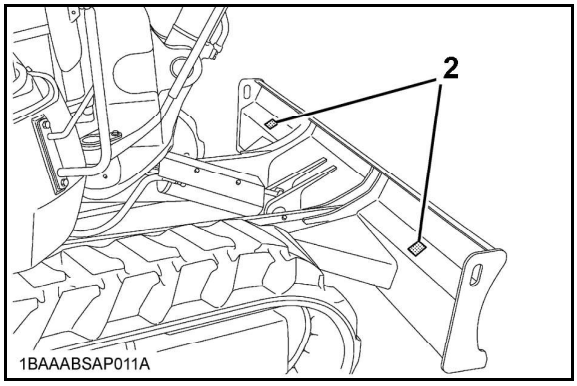
3) Code #: 69198-5784-0
Risk of accidents due to incorrect operation!
Improper operating can lead to damage to the excavator, to serious accidents with a high risk of injury and death as a result.
- Please read the operating instructions before commissioning.

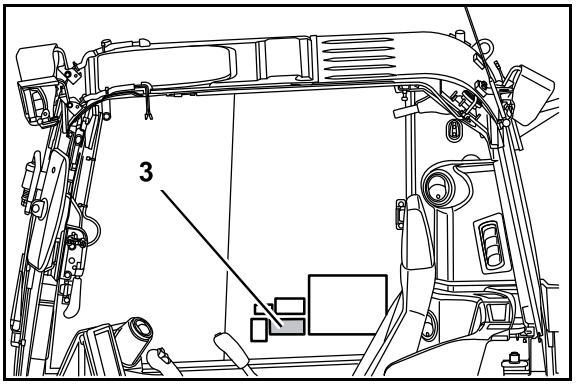


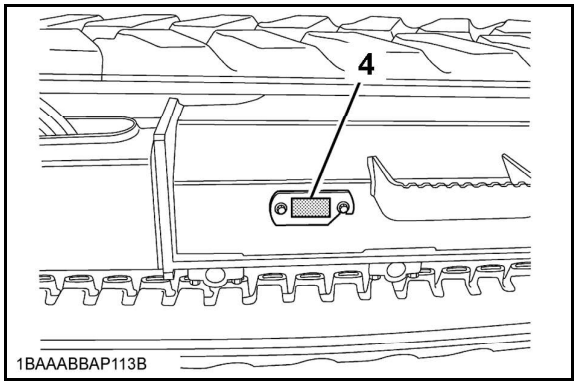
4) Code #: RB456-5795-0
Danger of injury from components under pressure!
In the case of improper operating of the crawler tensioner, grease or the pressure valve can splash out under high pressure and lead to injury.
- Before working on the crawler tensioner, please read the operating instructions!





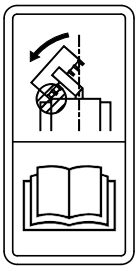






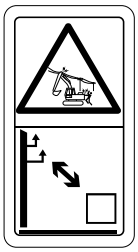
1) Code #: RB419-5796-0
Not a lifting point

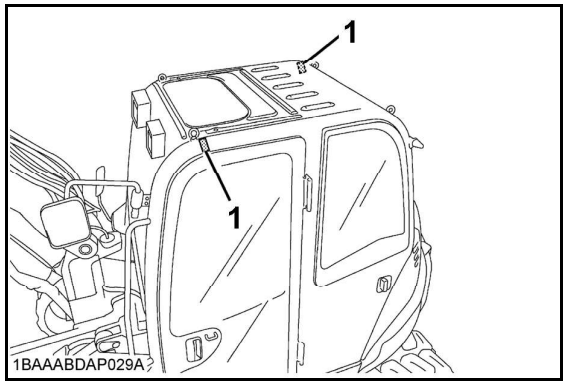
2) Code #: RD839-5739-0
Caution! Risk of component damage!
When using a wider or deeper bucket, take good care when swinging or retracting the front attachments to make sure that the bucket does not hit the cab.
- Read the Operating Instructions for the attachment.

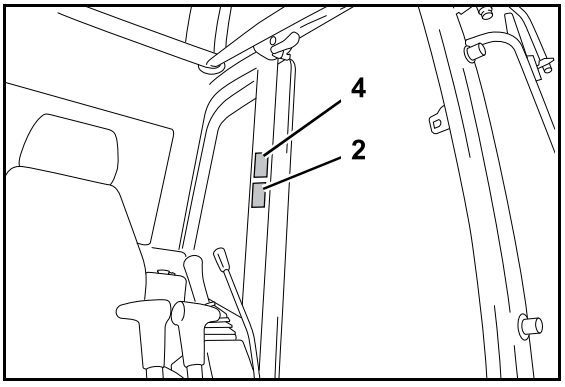


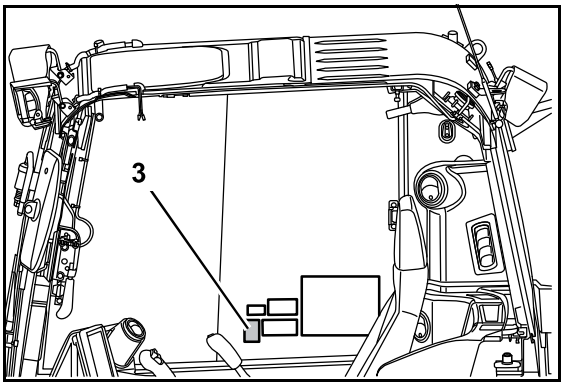
3) Code #: RD559-5749-0
Risk of accidents if the load is too heavy during lifting operations!
An acoustic signal sounds and a warning light flashes if the rated load is exceeded.
- Switch on overload warning system before using the lifting equipment!

4) Code #: RD859-5936-0
Danger due to electric current!
When working in the vicinity of overhead power lines without a sufficient safe distance between them and the machine, the electricity can jump onto the machine.
- Maintain a safe distance from overhead power lines.

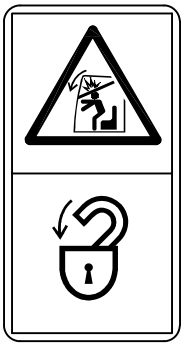




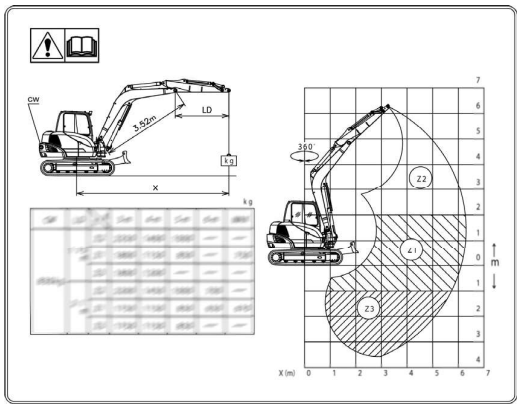


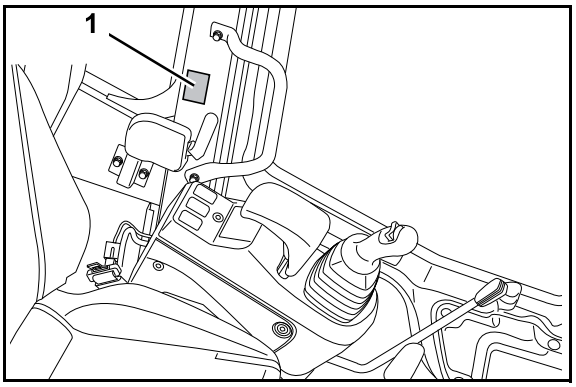


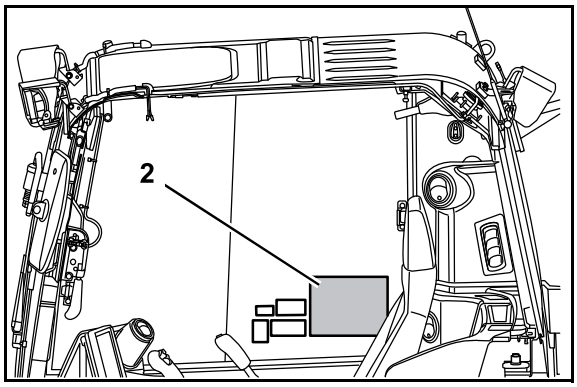
1) Code #: RD579-5793-0
Risk of injury from falling front window!
If the front window has been pushed up and not is properly bolted, there is a risk that the front window will close automatically and hit the operator in the head.
- Always lock front window securely.



2) Code #: RD849-5748-0
Max. lifting load during swivel operation is 360°
KX085-5 with operating weight 8467 kg





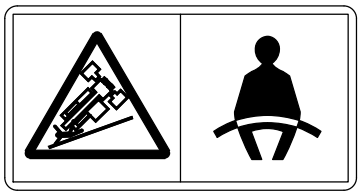


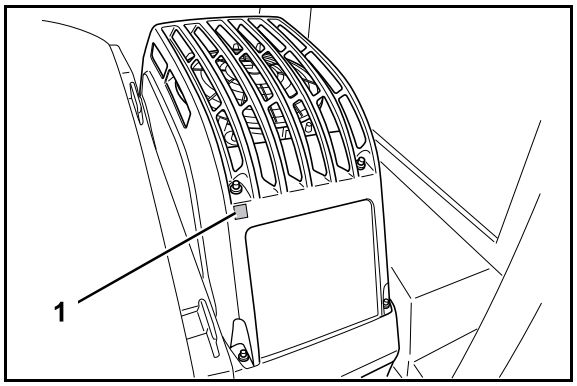
1) Code #: RD859-5765-0
Risk of accidents!
The protection cover may break under stress.
- Do not enter

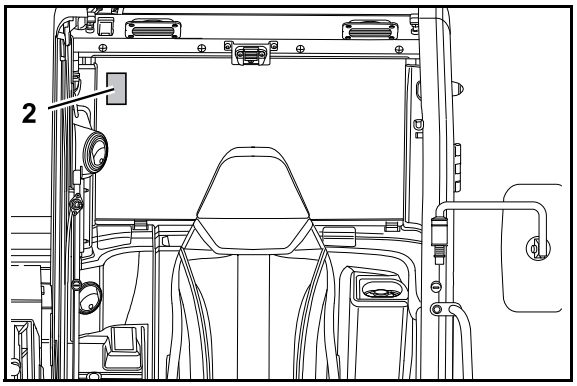
2) Code #: RD809-5714-0
Emergency exit

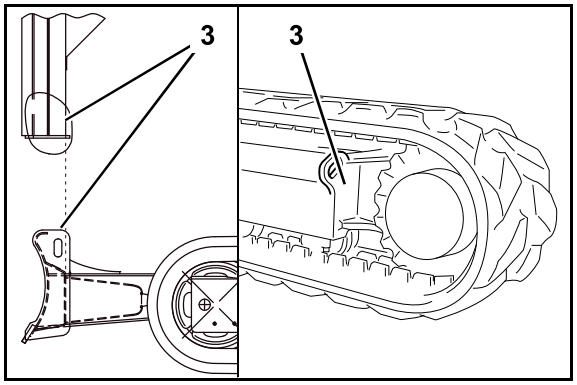
3) Code #: RD809-5733-0 (both sides)
Tie-down eye - Only use to lash down the machine!

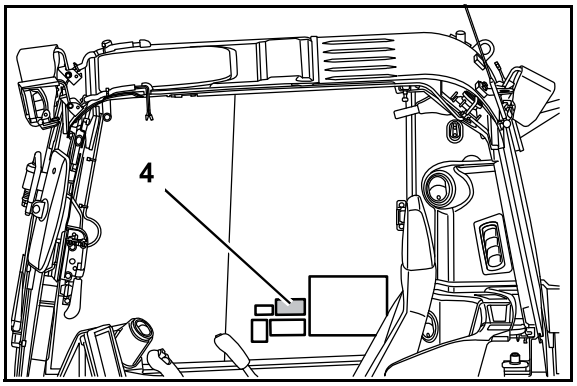
4) Code #: RD579-5743-0
Risk of personal injury!
- Always buckle up.



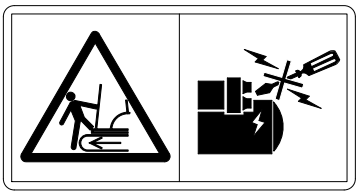




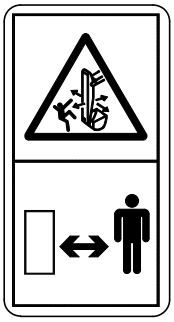


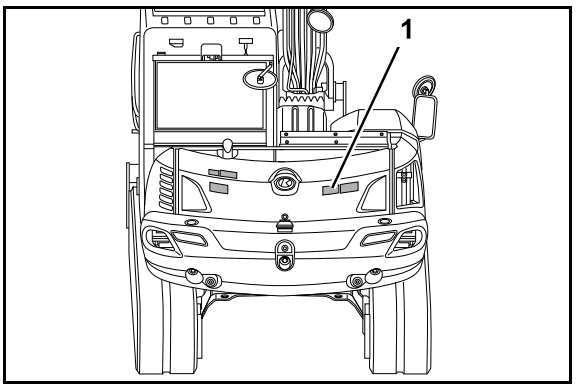


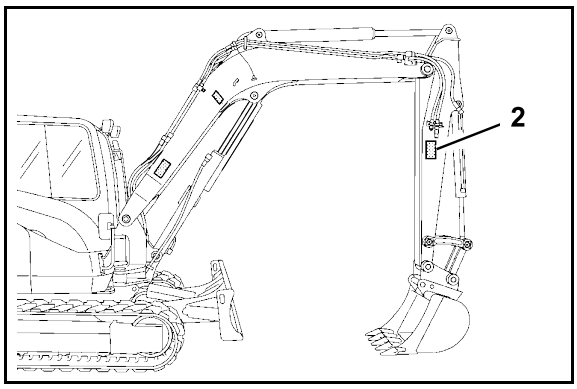
1) Code #: RD579-5739-0
Mortal danger from moving excavator!
When staying in the danger zone and in the case of a suddenly starting excavator, there is the danger of being run over by the excavator.
- Only start the machine from the operator's seat.
- Do not start the machine by bypassing the starter poles.



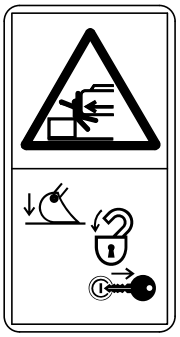
2) Code #: RB456-5789-0
Mortal danger by crushing!
Low safe distance to the excavator and to obstacles can prevent an emergency exit from the danger zone. Crushing by excavator results in severe injury or death.
- Do not stand in the working area of the front attachments.



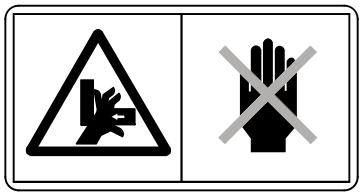




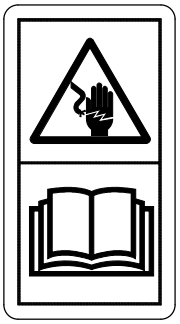
1) Code #: RD579-5783-0
Mortal danger by crushing!
Low safe distance to the machine and to obstacles can prevent an emergency exit from the danger zone. Crushing by machine results in severe injury or death.
- Before leaving the machine, lower bucket to the ground.
- Lift the control lever lock, turn the starter switch to the STOP position and remove the key.

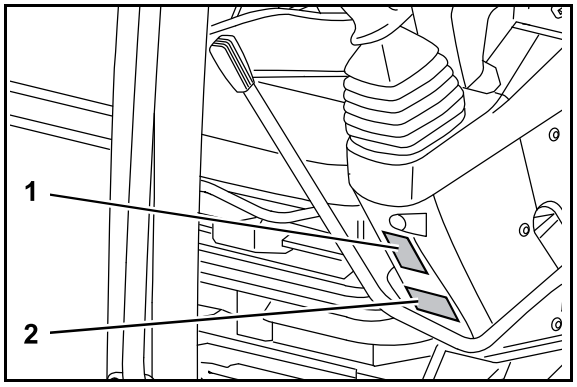


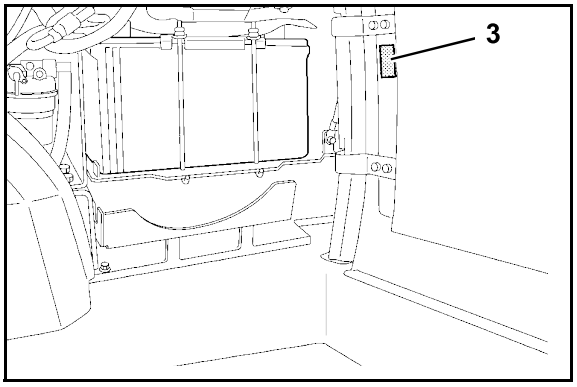
2) Code #: RD579-5755-0
Risk of being crushed due to narrow gap!
The gap between the door and the counterweight is narrow. When fastening the cab door to the door stop or to the counterweight, there is a danger of the hands or fingers being crushed in the door crack. When moving down the unload lever, your hands and fingers may get jammed in between the right console and seat bracket.
- Only open and close the cabin door using the grips intended for that purpose.
- Never put your hands and fingers in the gap between them.



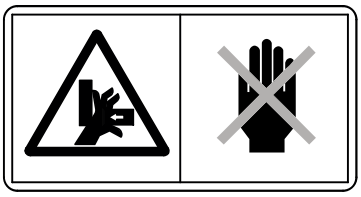
3) Code #: RD839-5786-0
Danger due to electric current!
Excess voltage can cause injuries while working on the electrical system.
- Before working on the electrical system, disconnect it from the power supply.
- Wear personal protective equipment.
- Before working on the electrical system, please read the operating instructions!



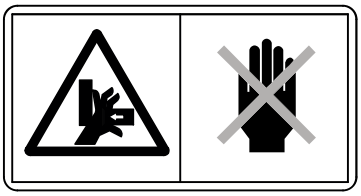


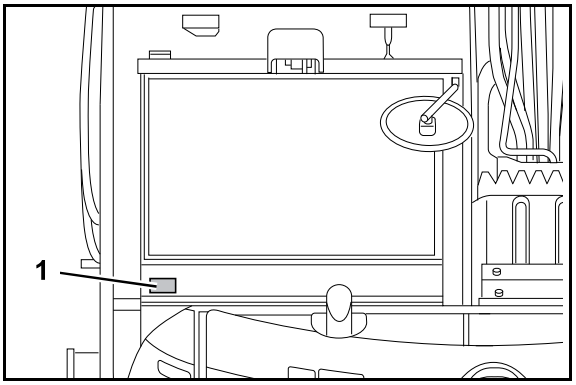


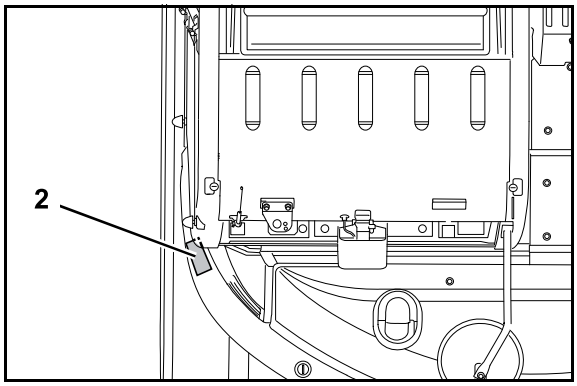
1) Code #: RD579-5755-0
Risk of being crushed due to narrow gap!
The gap between the door and the counterweight is narrow. When fastening the cab door to the door stop or to the counterweight, there is a danger of the hands or fingers being crushed in the door crack.
- Only open and close the cabin door using the grips intended for that purpose.



2) Code #: RD579-5755-0
Risk of being crushed due to narrow gap!
The gap between the door and the counterweight is narrow. When fastening the cab door to the door stop or to the counterweight, there is a danger of the hands or fingers being crushed in the door crack.
- Only open and close the cabin door using the grips intended for that purpose.







Safety devices

Before starting the machine, all safety devices must be installed properly and operational. Manipulating the safety devices is prohibited.

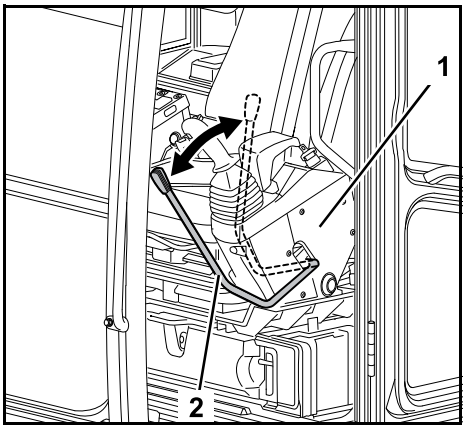
Protective devices may only be removed once

- the machine is standing still and the engine is stopped
- and secured against restarting (starter switch in STOP position and key removed).

Locking the controls

If the left control console (1) is completely raised with the control lever lock (2), the hydraulic functions of the control lever, the drive lever, the boom swing pedal, the dozer control lever and the auxiliary port are locked. This circumstance allows safe getting on and off.

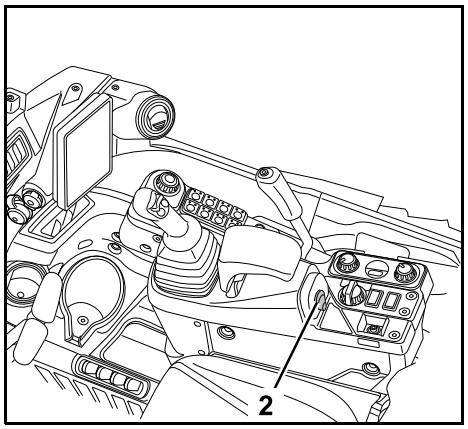
- To unlock the hydraulic functions, lower the control console completely using the control lever lock.



Engine emergency stop

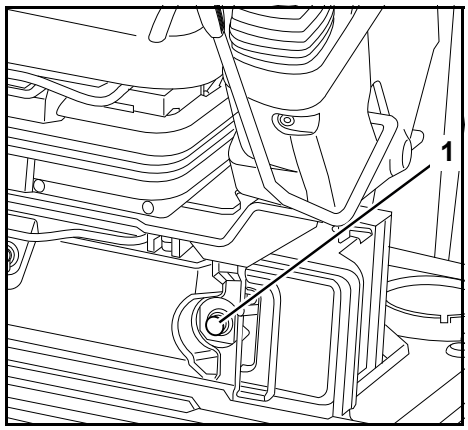
The engine turns off when the starter switch (2) is switched to the STOP position.

If the engine cannot be turned off, please actuate the engine emergency stop in order to turn off the engine.



To stop the engine:

- Pull the knob (1) until the engine stops.
- After the engine has stopped, push in the knob.



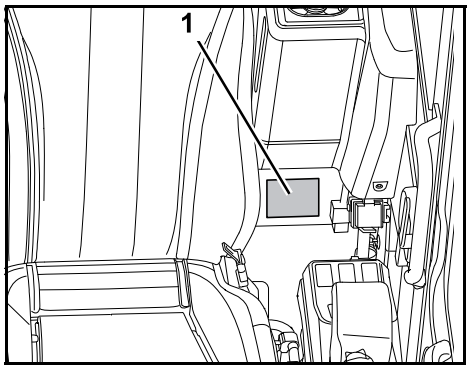
Cab protective structure

The machine is equipped with a protective structure that protects the operator from severe injury or death if the machine falls over or overturns and in the case of falling objects.

Cab was constructed in accordance with current safety standards and tested for verification as:

Roll-over protection	ROPS (Roll-Over Protective Structure)
Tipping-over protective structure	TOPS (Tipping-Over Protective Structure)
Driver protection	OPG (Operator Protective Guard)

To ensure greatest protection by means of this protective structure, the following applies:



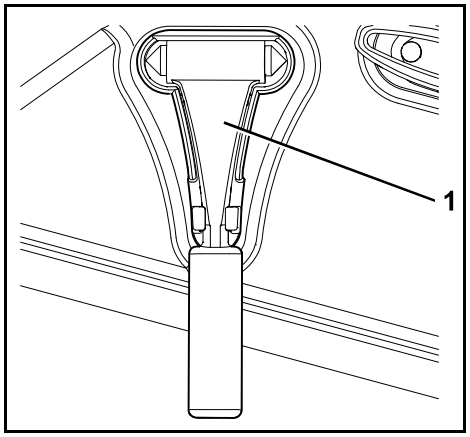
- The seat belt must be fastened while the machine is being operated.
- Do not make any structural changes to the protective structure (e.g. drilling, welding brackets for fire extinguishers or other equipment). This can weaken or damage the protective structure.
- If parts of the protective structure of the cabin are damaged or plastically deformed, the cabin must be replaced. Repairing the damaged protective structure is not permitted. The protective function cannot be adequately restored through repairs and is not guaranteed in the event of accidents.
- Never operate the machine without the protective structure.
- Never operate the machine with a higher operating weight than the maximum permissible total weight indicated on the ROPS identification plate (1).

When using a hydraulic hammer or other attachment for demolition work where material (e.g. asphalt) is removed and can uncontrollably sputter away, a gravel guard is recommended for protection.

If a front protective grille or a roof protective grille is required, a KUBOTA gravel guard (optional equipment) can be installed.

Emergency hammer

In case of an accident where the machine cab door and windows can not be opened, the operator can break the window panes with the emergency hammer (1).



STOP

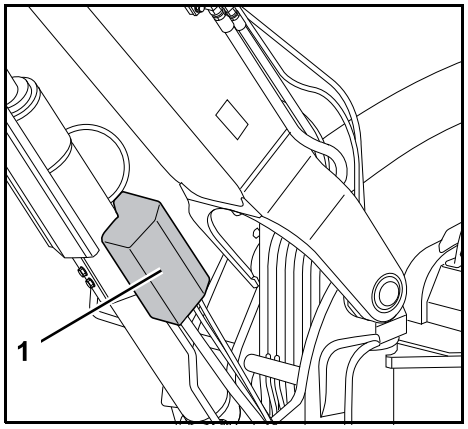
When breaking the window pane, close your eyes and cover them with an arm.

Pipe safety valve

The pipe safety valve prevents the load from suddenly lowering during lifting operations in the event a pipe or hose bursts.

One pipe safety valve (1) is attached directly to each hydraulic port on the boom cylinder and to each hydraulic port on the arm cylinder. Optionally, a pipe safety valve can be attached to the hydraulic port on the dozer cylinder.

Machines that will be used for lifting operations must be equipped with at least one pipe safety valve on the boom cylinder and arm cylinder, together with an overload warning system (page 35) according to EN 474-5.
If the dozer is being used to increase the machine's stability, an additional pipe safety valve must be installed in accordance with EN 474-1.



To acquire the proper equipment for your machine, please contact your KUBOTA dealer.

The pipe safety valve is adjusted in the factory on the particular machine.
Manipulating the pipe safety valve will void the warranty.

STOP

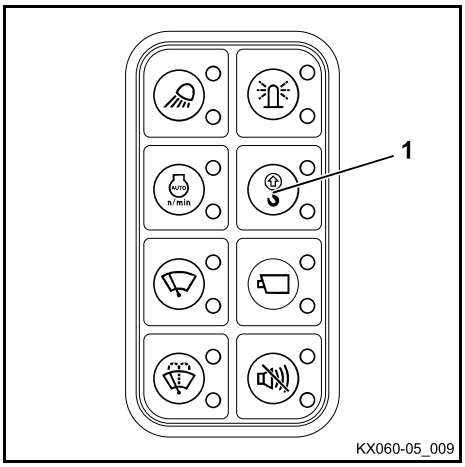
Any manipulation can result in substantial personal injuries, even death, and is therefore strictly prohibited.

The manipulation and repair of the pipe safety valves is prohibited. They may only be replaced by your KUBOTA dealer as a kit.

Overload warning system

An overload warning function informs the operator immediately if there is an overload. The warning system is controlled by the pressure switch at the pipe safety valve. The load is measured by the pressure at the base of the cylinder.

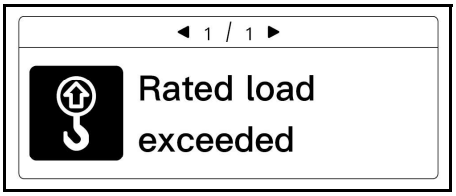
The warning device is activated with the overload warning switch (1). In the event of an overload, an acoustic signal sounds and "Rated load exceeded" appears in the display.



When turn the starter switch to the RUN position, an acoustic signal sounds. Before activating overload warning, make sure that you hear an acoustic signal. If you cannot hear it, machine must not be used for lifting operation. Please contact your KUBOTA dealer immediately.

An overload warning function is only available if the machine is equipped for lifting operations. To acquire the proper equipment for your machine, please contact your KUBOTA dealer.

Machines used for lifting operations must be equipped with at least one pipe safety valve on the boom and arm, together with an overload warning device in accordance with EN 474-5. If the dozer is being used to increase the machine's stability, an additional pipe safety valve must be installed in accordance with EN 474-1.



When changing from rubber crawlers to steel crawlers, or from steel crawlers to rubber crawlers, or when modifying the length of the arm, please contact your KUBOTA dealer.

The overload warning function must be enabled during any lifting operation to prevent personal injuries and damage to equipment.

Hazards coming from the hydraulic system

If hydraulic oil gets into the eyes, rinse them immediately with clear water and subsequently seek medical aid.

Do not allow hydraulic oil to come into contact with skin or clothing. Skin parts that may have come into contact with hydraulic oil must be washed with water and soap immediately, if possible. Do this thoroughly and repeatedly, otherwise there is a risk of damage to the skin.

Immediately take off any clothes dirtied or soaked with hydraulic oil.

Persons who have inhaled hydraulic oil vapours (mist) should be taken to a doctor immediately.

If leaks have occurred in the hydraulic system, the machine may not be taken into operation or, if in operation, operation must cease at once.

Do not use the naked hand to search for leaks; always use a piece of wood or cardboard. Protective clothing (eye protection and gloves) must be worn when seeking leaks.

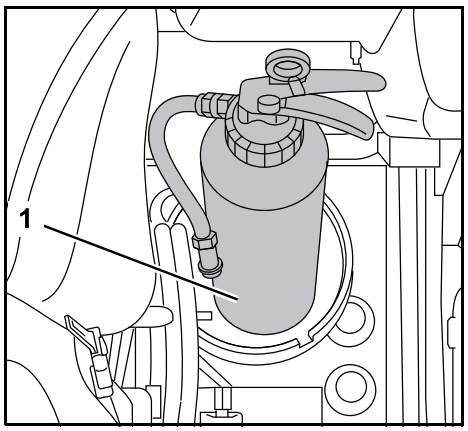
Leaking hydraulic oil must be bound immediately with an oil binding agent. The contaminated oil binding agent must be stored in suitable containers and in accordance with the valid regulations.

Fire protection

The machine components and attachments (in particular the engine and the exhaust system) reach high temperatures even under normal working conditions. An electric installation that is damaged or not properly serviced may lead to flashovers and/or electric arcs. The following fire protection guidelines may help you ensure the maintenance and efficiency of your equipment and minimise fire hazards.

- Remove any accumulated dirt adjacent to hot components, e.g. engine, turbo charger, diesel particle filter muffler, exhaust manifold/tubes, etc. If the machine is being used to full capacity, the cleaning procedure should be performed more frequently.
- Accumulated residues from plants and trees, or any other flammable materials, should be removed from the machine. This must be observed in particular in the proximity of the engine and the exhaust system, but also in the swivel frame, the track frame, and the boom.
- Check the condition and wear of all fuel lines and hydraulic hoses. To avoid leakage, replace any worn parts immediately.
- Electric cables and connections must be checked regularly for signs of damage. Damaged components and lines must be replaced or repaired before starting up the machine. All electric connections must be kept clean and tight.
- Exhaust pipes and diesel particle filter mufflers must be checked daily for leaks, damage and any loose or missing joints. Leaking or damaged exhaust system components must be replaced or repaired before starting up the machine.
- Always keep a multi-purpose fire extinguisher on or close to the machine. Familiarise yourself with the operation of the fire extinguisher. In the event of a fire in the electrical or hydraulic system, use a CO_2 fire extinguisher to put it out.
- A fire extinguisher (1) can be placed to the left of the operator's seat.

A fire extinguisher is not included in the standard equipment of the machine.



RECOVERY, LOADING AND TRANSPORT

Safety rules for recovery

- For recovery of the machine, a towing vehicle of at least the same weight class as the machine must be used.
- A tow bar must be used for the recovery. If a tow rope is used, an additional vehicle to brake the machine must also be attached. The tow bar or tow rope must be suitable for the recovery of the machine in respect of the towed load. Do not use damaged recovery aids.
- Do not step into the danger zone between the vehicles during the recovery procedure. If a tow rope is used, keep a distance of at least 1.5 times the length of the rope.
- Use the towing eye on the track frame for the recovery.
- The above safety rules also apply if the machine is used as the towing or recovery vehicle.
- Observe the admissible values for the towed load and the vertical load during recovery operations, see the “Technical data” section (page 48).

Safety rules while loading with a crane

- Crane and lifting gear must be approved and suited for carrying the load to be lifted.
- Before using the crane and the lifting gear, make sure that the specified safety inspections have been carried out regularly and that the crane and lifting gear are in good working order and sound condition.
- The machine must only be lifted from the intended lifting points. Lifting from the cab roof is prohibited as this can cause severe damage.
- Never attach a crane hook to the lower edge of the dozer! The crane hook can slip off sideways while lifting and the machine may fall off.
- Always adhere to the valid safety regulations for the lifting of loads.
- The machine must be secured with a holding rope when it is being lifted.
- The crane operator is responsible for the observance of these safety rules.

Safety rules for transport

Risk of accidents if the load is not secured properly!
The following safety rules must be observed.

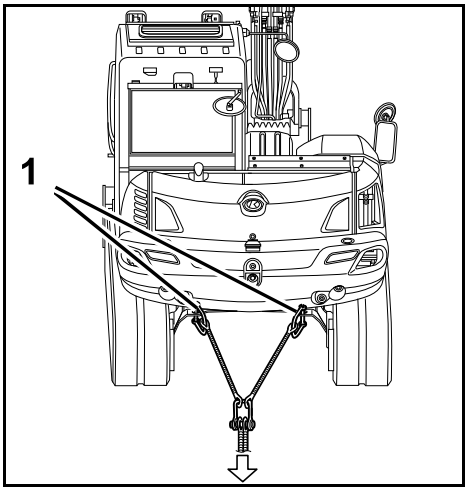
Risk of accidents due to unapproved use of the machine!
Driving the machine onto the transport vehicle without using ramps and with the help of the boom is prohibited!

- Check whether the transport vehicle is designed for carrying the machine. Only transport the machine on a transport vehicle with sufficient load-bearing capacity.
- Engage the handbrake on the transport vehicle and secure the front and rear wheels using chocks to prevent the vehicle from rolling away.
- Make sure the ramps to be used have sufficient load-bearing capacity to carry the operating weight of the machine.
- Only use ramps with sufficient load-bearing capacity. They must be wider than the machine's chains and have footboards on the sides.
- Position the ramps on the transport vehicle so that the centre line of the transport vehicle is aligned with the centre line of the machine to be loaded.
- Securely fasten the ramps to prevent them from sliding.
- In order to prevent the transport vehicle from tilting when driving the machine onto it, brace the rear of the transport vehicle with adequately dimensioned supports.
- Before driving the machine onto the transport vehicle, clean the loading area and chains of the machine in order to ensure as much friction as possible between the chains and the loading area.
- Assign a guide for driving the machine up and down the ramp. The guide is responsible for ensuring safe loading.
- Only move the machine when instructed to do so by the guide. The operator and guide must maintain constant eye contact. If the operator cannot see the guide, stop the machine immediately.
- Secure the machine on the transport surface to prevent it from sliding, e.g. using anti-slip materials, wooden beams, wedges or wooden structures. This auxiliary equipment must be secured to prevent it from coming loose and becoming lost, e.g. by using tacks on a wooden transport surface.
- In order to ensure the machine's stability during transport, lash down the machine appropriately using the determined preload force on the transport vehicle.
- Only use approved and labelled lashing material, such as lashing straps or sling chains that are suited for the machine's weight.
- The driver of the transport vehicle is responsible for securely fastening the machine onto the vehicle.
- When transporting the machine, always maintain a distance of 1.0 m from overhead power lines. The permitted dimensions for the transport vehicle including the loaded machine must be observed in accordance with the applicable traffic rules and regulations.

Recovery

Adhere to the safety rules (page 17) and the safety rules for recovery (page 37).

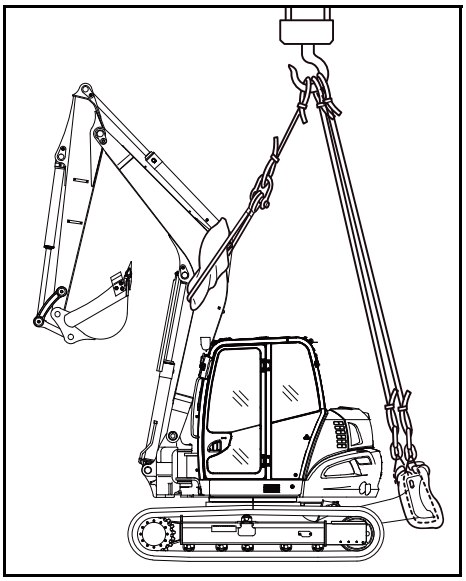
A recovery is only allowed over a short distance and at walking speed (0.5 m/s ~ 1.0 m/s).



- Attach the tow bar or tow rope to the towing eye (1) on the machine and on the towing vehicle.
- If the towing eye on the machine is not accessible, a tow rope can also be fastened around the centre of the dozer.
- During the recovery procedure, the operator must be seated on the operator's place.
- Drive slowly with the towing vehicle to avoid abrupt impacts.

Hoisting the machine with a crane

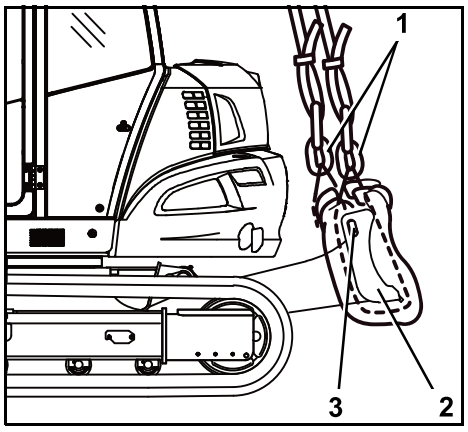
Adhere to the safety rules (page 17) and the safety rules for hoisting the machine with a crane (page 37).



- Bring the machine to the lifting position (see figure) on level ground.
- Lift the dozer until the dozer cylinders are fully retracted. Also see the “Excavation work (operating the controls)” section (page 115).
- Bring the boom in line with the longitudinal axis of the swivel frame.
- Completely extend the boom cylinder, arm cylinder and bucket cylinder.
- Rotate the swivel frame so that the dozer is located at the rear.
- Close and lock the door and covers.

The machine must only be lifted from the intended lifting points. Lifting from any other points is prohibited as this can cause severe damage.

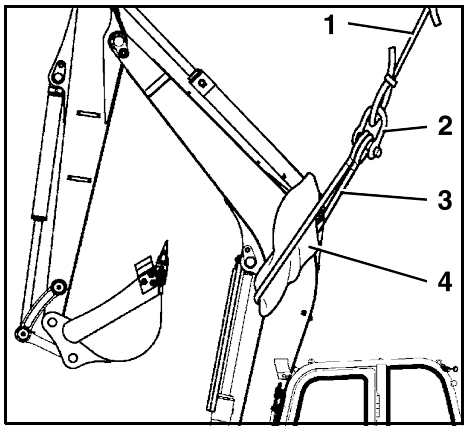
- Attach the lifting gear (1) on the right- and left-hand side around the dozer blade (2). Protect the dozer against damage using pieces of cloth.



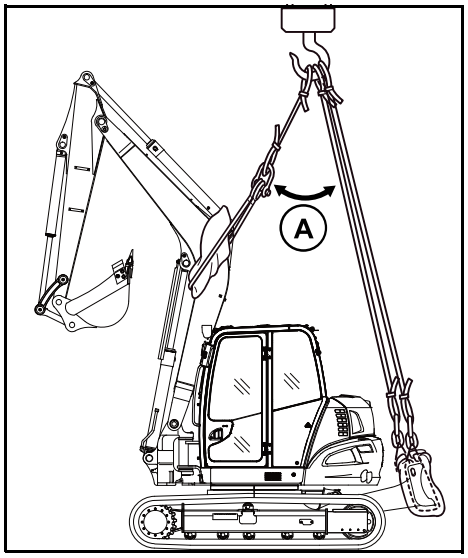
STOP

Do not use the tie-down eyes (3).

- Fasten the lifting gear (3) around the boom as illustrated in the figure. Protect the boom (4) against damage using pieces of cloth. Connect lifting gear (3) and lifting gear (1) using a shackle (2).



- Slightly tension the lifting gear with the crane (see figure). The lifting angle (A) must be ≤ 55°.



- Always keep the machine level. Be sure that the centre line of the crane hook is aligned as exactly as possible with the centre line of the machine and that the lifting angle is as specified. Lift the machine.

STOP

Risk of accidents!
Lifting the machine from unapproved lifting points can cause the machine to fall.
- *Only lift the machine from the intended lifting points.*
- *Lifting from the cab roof is prohibited!*

Transport on a flat bed trailer

Adhere to the “Safety rules” chapter (page 17) and the “Safety rules for transport” section (page 38).

Mortal danger by crushing!
Nobody is allowed in the loading area or in close proximity to that area while operating the machine on the ramp and in the loading area, e.g. when driving onto the ramp or when rotating the swivel frame.

- *Guides must maintain a safe distance from the machine.*

Risk of accidents due to machine falling down!
When changing the direction of travel or when manoeuvring the machine, it can slip and fall off the ramp or loading area.

- *Do not turn or steer when driving up the ramps.*
- *If the machine cannot be driven safely and in a straight line onto the loading area, drive the machine back down, realign it and drive straight ahead onto the area.*
- *Only work with a guide.*

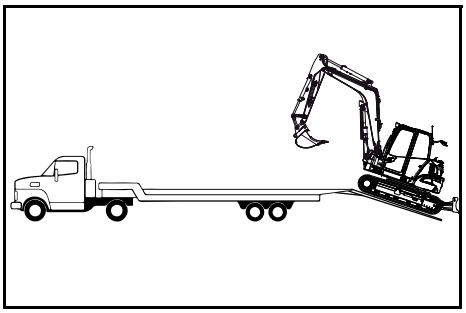
Caution when rotating the swivel frame!
The front attachments can hit the transport vehicle. This can damage the transport vehicle and the machine.

- *Only work with a guide.*

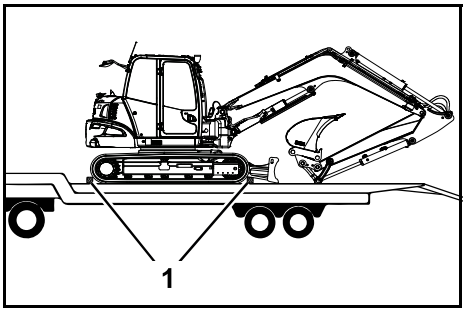
Risk of accidents due to malfunction in transport safety device!
The machine’s lashing points are designed and constructed to secure the machine safely. If fastening points other than the lashing points described here are used, the transport safety device could malfunction and the machine could slip or fall from the transport vehicle while being transported.

- *Only used the indicated lashing points for the transport safety device.*

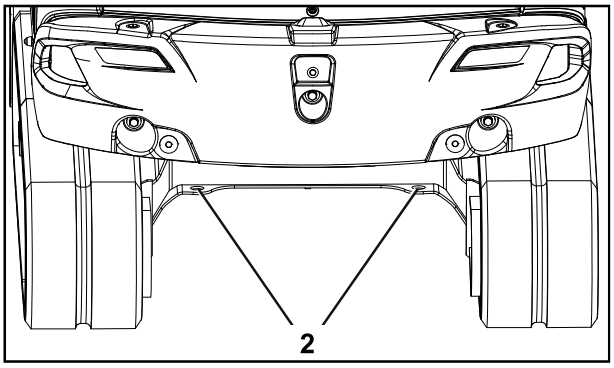
- Provide approved and labelled lashing material, such as lashing straps or sling chains, that are appropriate for the machine’s weight (page 48).
- Place the loading ramps on the transport vehicle at an angle of 10° to 15°. When doing so, take into account the track width of the machine.
- Fasten the ramps to the transport vehicle in such a way that they do not slide when driving the machine onto it.
- Align the machine with the centre of the ramps and drive it straight onto the loading area until it has reached the parking space.

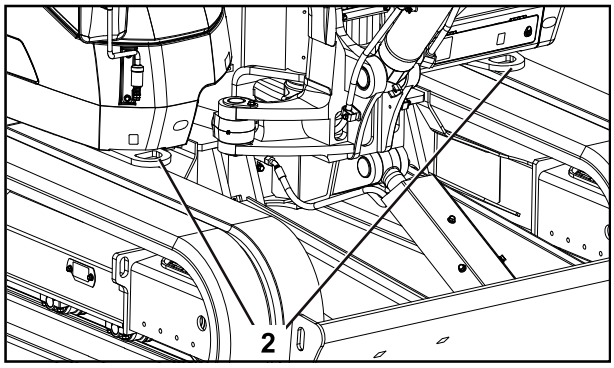


- Lower the dozer onto the loading area.
- Rotate the swivel frame 180° until the front attachments face the rear of the transport vehicle.
- Completely retract the arm and bucket. Lower the boom until the bucket linkages touch the loading area.

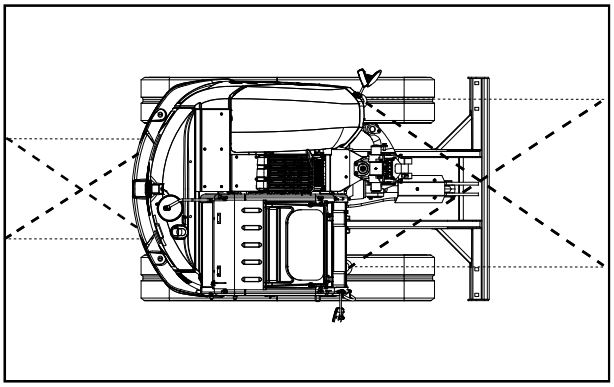


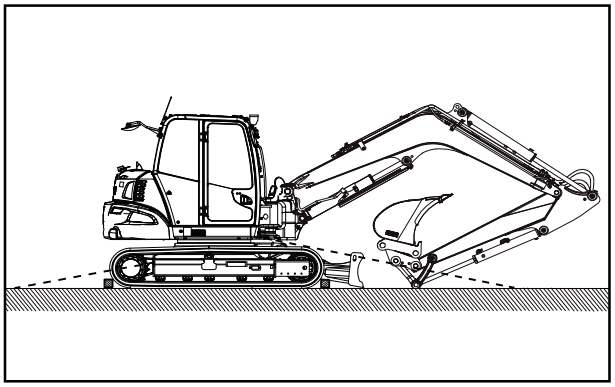
- Secure the machine in front of and behind the chains to prevent it from slipping, e.g. using wooden beams (previous Figure/1).
- In order to prevent the machine from tipping on the transport vehicle, only use the approved lashing points (2) on the swivel frame.



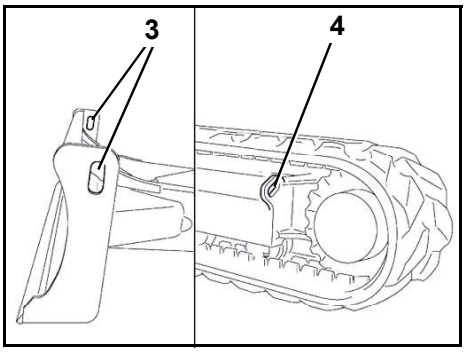


- Fasten the lashing material to the approved lashing points and tension diagonally.



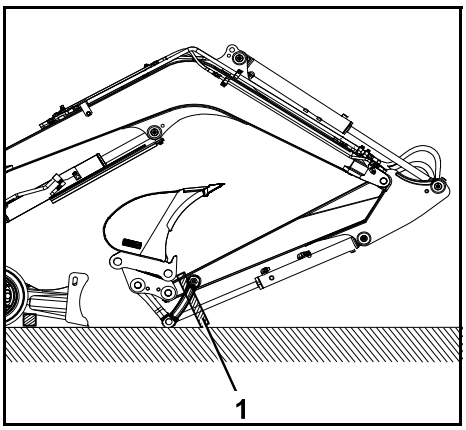


- If no lashing points are available on the swivel frame, only use the lashing points on the dozer (3) and on the track frame (4) illustrated in the following figure. Tension the lashing material on the dozer (3) diagonally. Tension the lashing material on the track frame (4) towards one side.



Potential malfunction when lashing down machine!
Do not tie down and tension the lashing material across the top of the chains. In this case, the machine is not lashed down securely and the chains can be damaged.

- In order to secure the swivel frame to prevent it from pendulating, tie down the bucket arm on the loading area using lashing material (1).



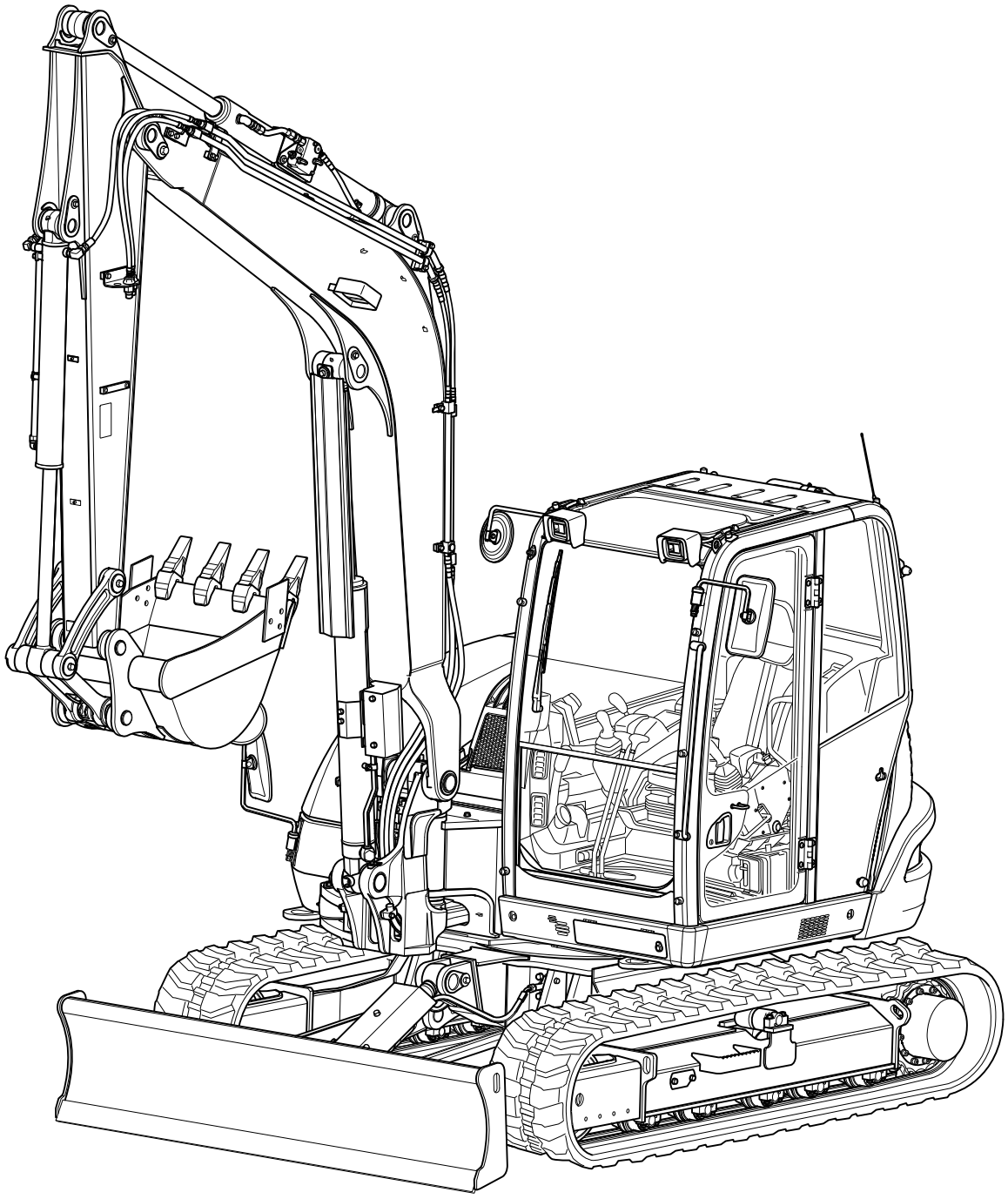
- After loading and securing the machine, tightly close all of its covers and doors.

DESCRIPTION OF THE MACHINE

Model overview

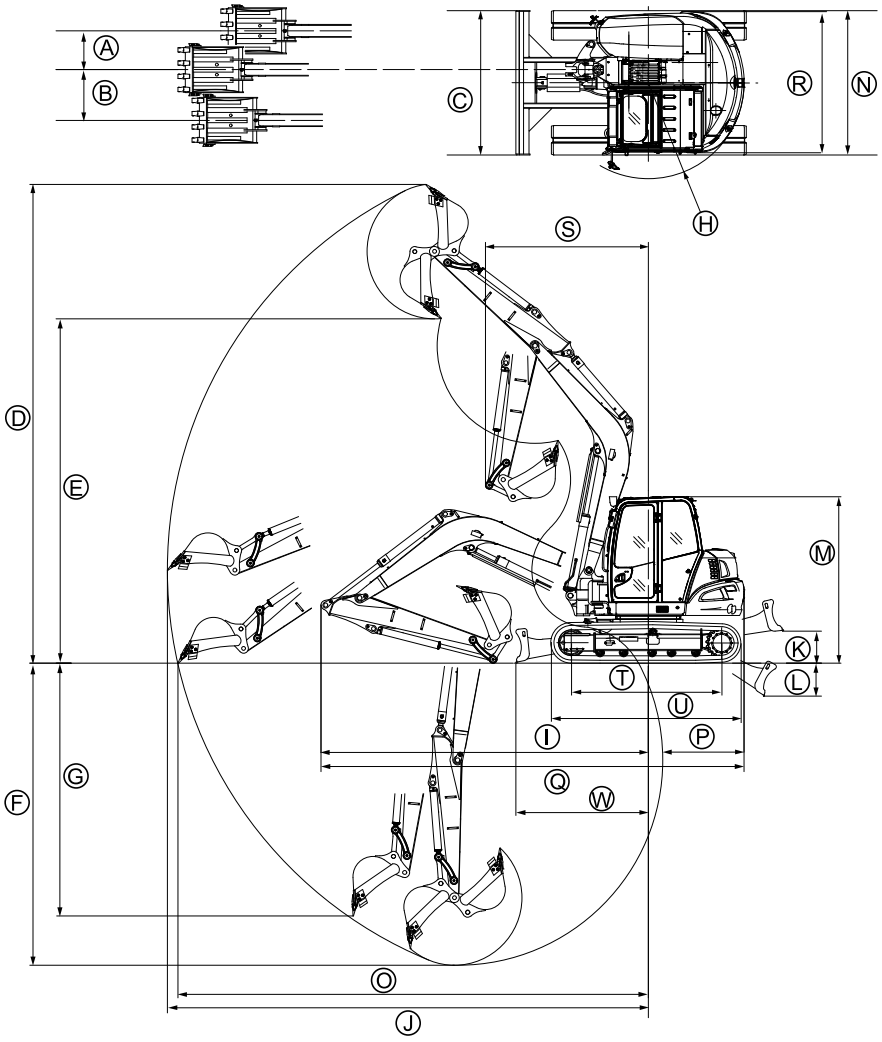
The excavator is available as CAB model only.

Model KX085-5



Dimensions

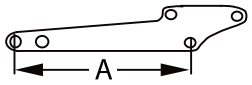
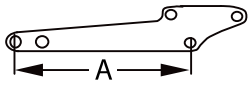
The dimensions of model KX085-5 can be found in the following illustration and table.



	A	B	C	D	E	F	G	H	I	J	K
1*	590	770	2200	7060	5010	4250	3510	1460	4950	7010	500
2*	590	770	2200	7300	5250	4600	3850	1460	4990	7330	500
	L	M	N	O	P	Q	R	S	T	U	W
1*	500	2540	2200	6840	1460	6410	2150	2410	2300	2900	2000
2*	500	2540	2200	7170	1460	6450	2150	2490	2300	2900	2000

* The table row corresponding to the arm attached to the machine applies. In addition, please note the “Design of arm” table below!

Arm version

Row	Name	Type	
1	Arm 1750 mm**		A = 1750 mm
2	Arm 2100 mm		A = 2100 mm

** Optional equipment

All dimensions in mm with original KUBOTA bucket and rubber crawlers.
Subject to technical changes.

Specifications

The specifications for this series are as follows.

			KUBOTA Excavator
Model name			KX085-5
Counterweight		kg	1140
Machine weight*		kg	8392
Operating weight**		kg	8467
Bucket (KUBOTA)	Capacity (CECE)	m^3	0.21
	Width with teeth	mm	800
Engine	Type		Water-cooled 4-cylinder turbo diesel engine
	Model name		V3307-CR-TE5
	Displacement	cm^3	3331
	Engine performance (ISO 14396)	kW	49.0
	Rated speed	1/min	2000
	CO_2 emission*** (Engine family KKBXL03.3E1D)	Non-road transient test cycle g/kWh	807.2
		Non-road steady-state test circle g/kWh	799.2
	Emission stage in engine type Approval according (EU) 2016/1628		Stage V
Performance	Swivel speed Swivel frame	1/min	9.8
	Vehicle speed	Travel speed km/h	4.8
		Low speed km/h	2.7
	Ground pressure (with driver 75 kg)	kPa (kgf/cm^2)	36.7
	Climbing performance	% (degrees)	36 (20)
	Max. lateral sway	% (degrees)	27 (15)
Dozer	width x height	mm	2200 x 500
Swing angle of the boom	Left	degrees	70
	Right	degrees	60
Auxiliary port 1	Max. flow rate (theoretical)	l/min	100
	Max. pressure	MPa (bar)	20.6 (206)
Auxiliary port 2	Max. flow rate (theoretical)	l/min	55.8
	Max. pressure	MPa (bar)	20.6 (206)
Fuel tank capacity		l	115
Pulling capacity at the towing eyes		N	116900
Vertical load at the towing eyes		N	12100
Noise level	LpA	dB (A)	72
	LwA (2000/14/EC) / (S.I. 2001/1701)	dB (A)	96

Vibration****	Hand arm system (ISO 5349-2:2001)	Digging	m/s² RMS	< 2.5
		Levelling	m/s² RMS	< 2.5
		Driving	m/s² RMS	4.40
		Idling	m/s² RMS	< 2.5
	Whole body (ISO 2631-1:1997)	Digging	m/s² RMS	< 0.5
		Levelling	m/s² RMS	< 0.5
		Driving	m/s² RMS	0.879
		Idling	m/s² RMS	< 0.5

* With original KUBOTA bucket 176.6 kg, ready for operation.

** Machine weight, incl. operator 75 kg.

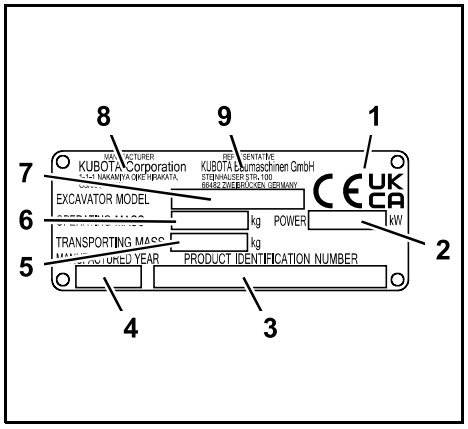
*** This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

**** These values are measured under specific conditions at maximum engine speed and can deviate, depending on the operating situation.

Identification of the machine

The type plate of the machine is located at the front of the swivel frame. The owner should enter the stamped data in the field on the back of the front cover.

1. Conformity marking
2. Engine performance
3. Product identification number
4. Year of construction
5. Transporting mass
6. Operating mass
7. Model name
8. Manufacturer
9. Representative



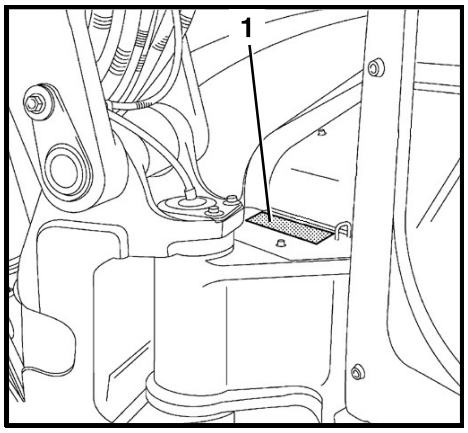
Product identification number

The machine's product identification number (1) is stamped on the swivel frame near the swing bracket.

The serial number can be determined based on the product identification number.

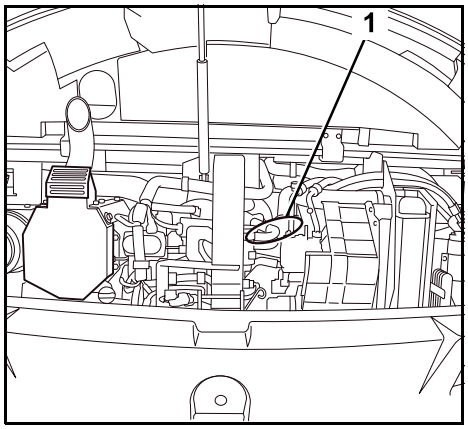
The last 5 digits of the product identification number make up the serial number.

K	B	C	_	_	_	_	_	_	_	_	_	**X**	**X**	**X**	**X**	**X**



Engine number

The engine number (1) is stuck on the valve cover of the engine.

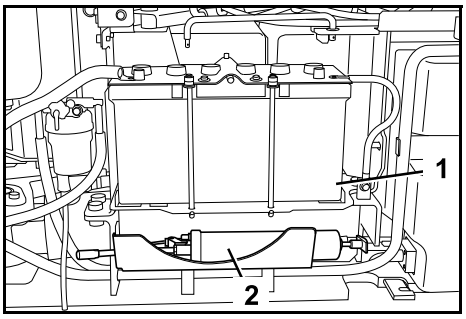


Standard equipment

This model includes the following standard equipment:
- Operating instructions with protective cover
- Spare parts catalogue
- Grease gun
- Spare fuses (20 A, 2x30 A, 50 A, 60 A, 100 A)
- Guarantee

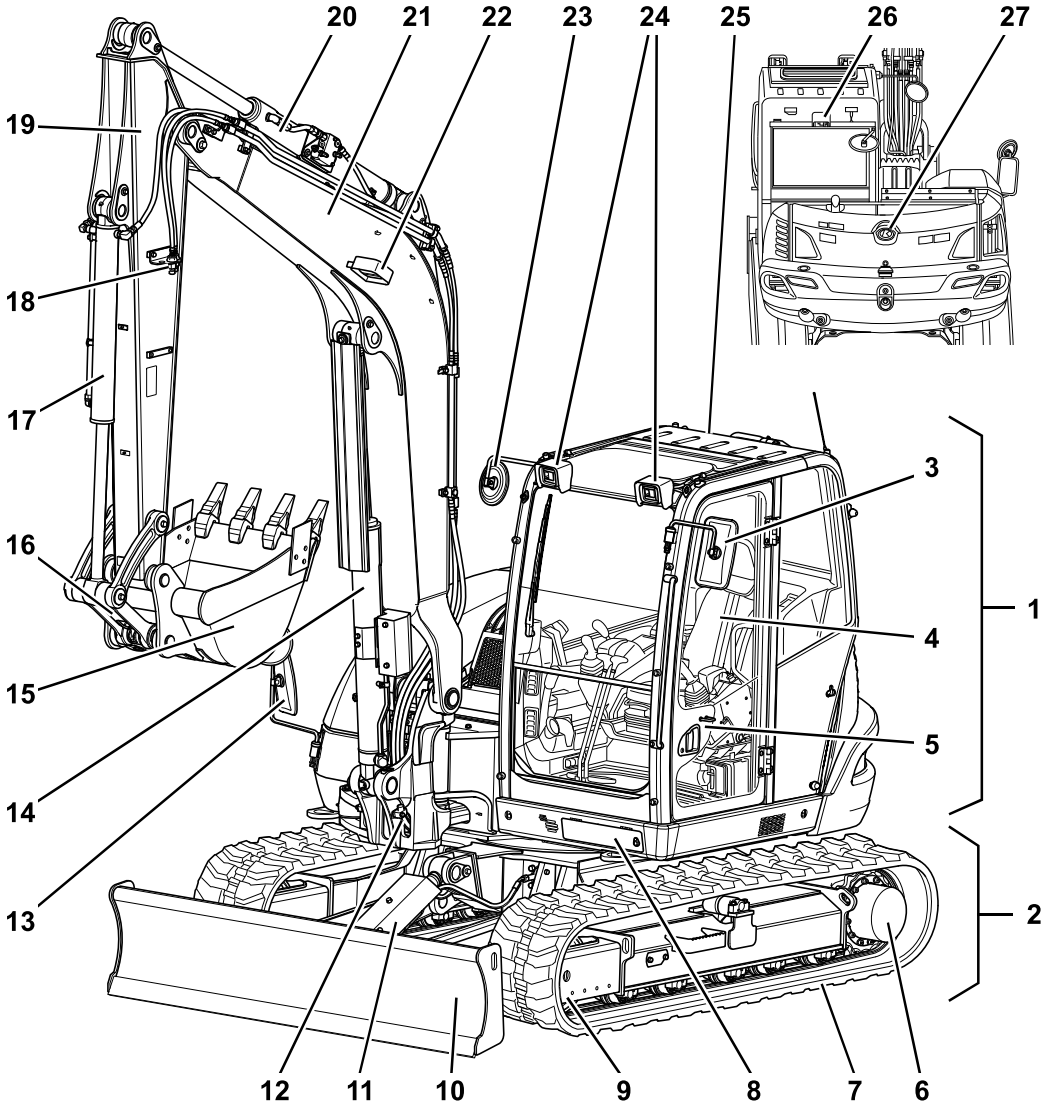
Stow the greasing gun (2) under the battery (1).

The spare parts catalogue, guarantee and spare fuses can be stowed together with the operating instructions (page 15).



ASSEMBLY AND FUNCTIONS

Component overview

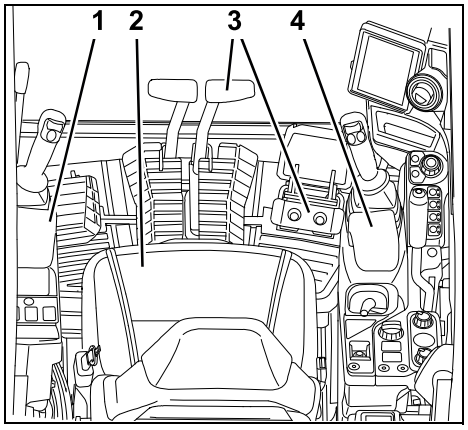


1. Swivel frame
2. Track frame
3. LH outside rear view mirror
4. Operator's place
5. Cab door
6. Drive sprocket
7. Crawler
8. Tool compartment
9. Idler
10. Dozer
11. Dozer cylinder
12. Swing block
13. RH outside rear view mirror
14. Boom cylinder
15. Bucket
16. Bucket linkage
17. Bucket cylinder
18. Auxiliary port connectors
19. Arm
20. Arm cylinder
21. Boom
22. Working light (boom)
23. RH outside rear view mirror
24. Working lights (cab)
25. Cab
26. Rear light
27. Rear view camera

Operator's place

The operator's place is located in the middle of the cab. It includes the following control elements:

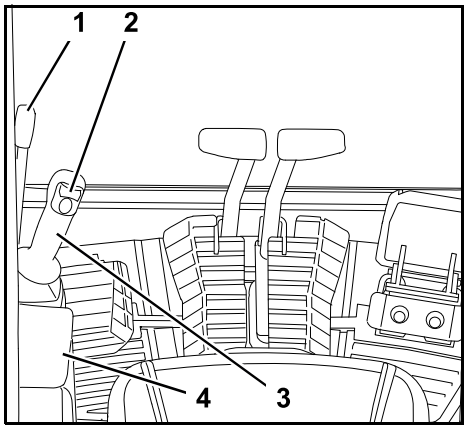
1. Left control console
2. Operator's seat
3. Drive levers and control pedals
4. Right control console



Left control console

The left control console includes the following components:

1. Control lever lock
2. Rocker switch for the auxiliary port 2
3. Left control lever
4. Wrist rest



Description of the components of the left control console

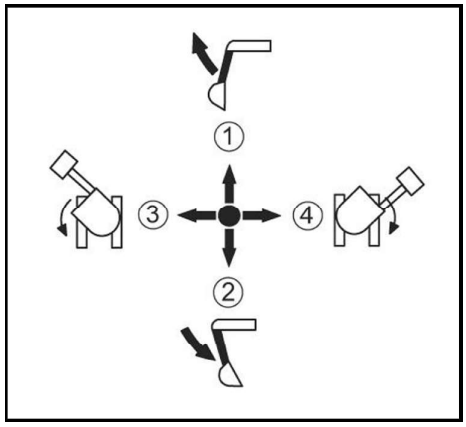
1. Control lever lock
To enter and leave the cab, the console must be raised by pulling up the control lever lock. The engine can only be started if the console is raised. The hydraulic functions of the control lever, the drive lever, the boom swing pedal, the dozer control lever and the auxiliary port are locked.

2. Rocker switch for the auxiliary port 2
The rocker switch for auxiliary port 2 controls the oil flow to auxiliary port 2. Turning the rocker switch to the left causes the oil to flow towards the connector on the left-hand side of the arm. Turning the rocker switch to the right causes the oil to flow towards the connector on the right-hand side of the arm. Auxiliary port 2 can be controlled proportionally (infinitely variable).

3. Left control lever

The left control lever is used to move the swivel frame and the arm.

The figure, in conjunction with the following table, shows the functions of the left control lever.



Position of control lever	Movement
1	Arm dump
2	Arm crowd
3	Swivel frame to the left
4	Swivel frame to the right

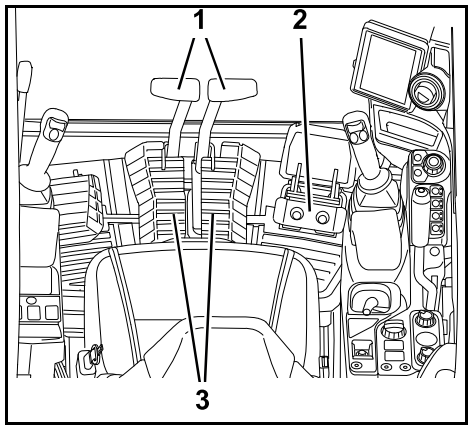
4. Wrist rest

The wrist rest allows fatigue-free operation of the control lever.

Drive levers and control pedals

Drive levers and control pedals include the following components:

1. Left and right drive levers
2. Boom swing pedal
3. Pedals for the left and right crawler



Drive levers and control pedals - description

1. Left and right drive levers

With the drive levers the machine can be driven forwards and backwards and also turned. The left drive lever controls the left track and the right drive lever controls the right track.

2. Boom swing pedal

This pedal is used to swing the boom right and left.

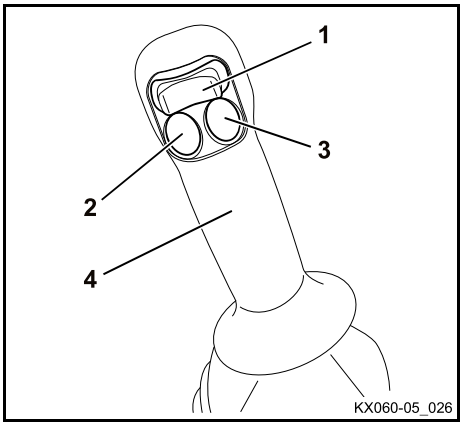
3. Pedals for the left and right crawler

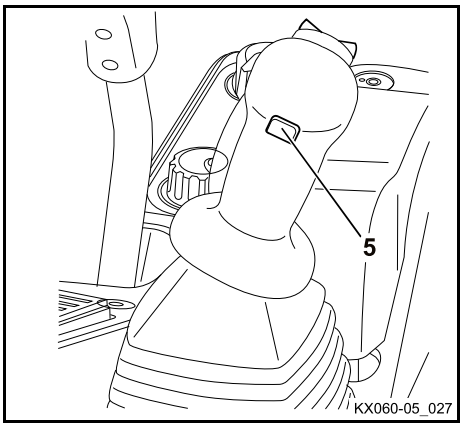
The pedals allow the operator to foot-control the drive levers.

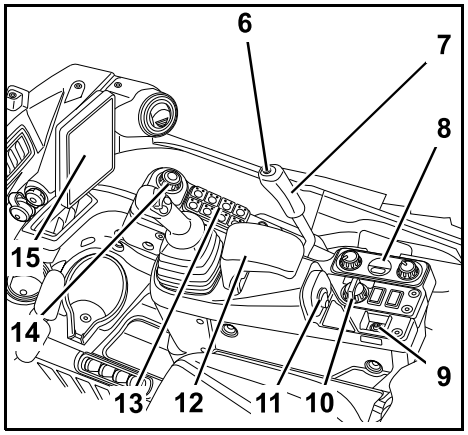
Right control console

The right-hand control console contains the following components:

1. Rocker switch for the auxiliary port 1
2. Horn switch
3. Auxiliary port enable switch
4. Right control lever
5. One way hold switch
6. Travel speed switch
7. Dozer control lever
8. Heating and air-conditioner control
9. Inhibit switch
10. Potentiometer for the adjustment of the engine speed
11. Starter switch
12. Wrist rest
13. Keypad switch
14. Dial switch
15. Display







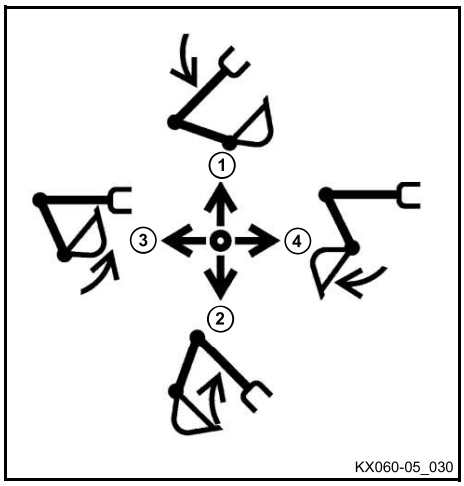
Description of the components of the right control console

1. **Rocker switch for the auxiliary port 1**
   The rocker switch for auxiliary port 1 controls the oil flow to auxiliary port 1. Turning the rocker switch to the left causes the oil to flow towards the connector on the left-hand side of the arm. Turning the rocker switch to the right causes the oil to flow towards the connector on the right-hand side of the arm. Auxiliary port 1 can be controlled proportionally (infinitely variable).

2. **Horn switch**
   Depressing the horn switch activates the horn.

3. **Auxiliary port enable switch**
   The auxiliary port enable switch activates the auxiliary port function.

4. **Right control lever**
   The right control lever is used to move the boom and the bucket.
   The figure, in conjunction with the following table, shows the functions of the right control lever.



Position of control lever	Movement
1	Lower boom
2	Raise boom
3	Bucket crowd
4	Bucket dump

5. **One way hold switch**
   Operating the one way hold switch results in a continuous oil flow to the auxiliary port connector to the left of the arm. When you operate it again, the oil flow discontinues. You can therefore operate an attachment without having to continuously hold down the button.

The attachment can move in an uncontrolled and sudden manner, there is a danger to life in the working area!
When using optional equipment that is not suitable for continuous oil flows (e.g. Powertilt), using the one-way hold switch poses a danger to life!
The auxiliary port cannot be operated proportionally with the one-way hold switch. The flow volume is adjusted to the highest level in the factory.

- *Before using the one-way hold switch, check that the optional equipment is suitable for use with continuous oil flows.*
- *Before using the one-way hold switch, make sure that nobody is in the working area.*
- *The flow volume of the auxiliary port must be adapted to the optional equipment.*

6. **Travel speed switch**
   Switches the travel speed mode on and off.

7. **Dozer control lever**
   The dozer control lever is used to raise or lower the dozer. Pushing the lever forward lowers the dozer and pulling it back raises it. Pushing the lever forward through the noticeable resistance moves the dozer into floating position.

8. **Heating and air-conditioner control**
   Operate the heater and the air-conditioner using the heating and air-conditioner control.

9. Inhibit switch
The inhibit switch (DPF = diesel particulate filter) is used to lock and release the automatic particle filter regeneration. The particle filter regeneration must be locked under certain working conditions. For example, when working close to people, animals, plants and/or flammable materials, the particle filter regeneration should be locked.

10. Potentiometer for the adjustment of the engine speed
The operator can use this potentiometer to set the engine RPM to any desired speed.

11. Starter switch
The starter switch serves as the master switch for the entire machine and as switch for preglowing and starting the engine.

12. Wrist rest
The wrist rest allows fatigue-free operation of the control lever.

13. Keypad switch
The functions of the keypad switch are described in the "Keypad switch - description" section (page 58).

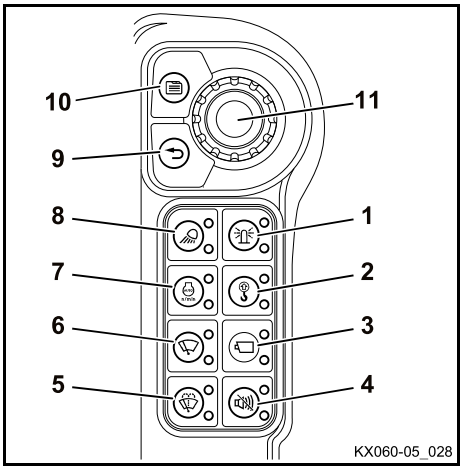
14. Dial switch
The switch is used to select the on-screen display and to change settings.

15. Display
The functions of the display are described in the “Description of the display” section (page 61).

Keypad switch

The keypad switch and the dial switch contains the following switches:

1. Rotary beacon switch
2. Overload warning switch
3. Camera switch
4. Without function
5. Washer switch
6. Wiper switch
7. AUTO IDLE switch
8. Instrument lighting/working lights switch
9. Return switch
10. Menu switch
11. Jog dial and Enter key



Keypad switch description

1. Rotary beacon switch
This switch activates and deactivates the rotary beacon (optional equipment).

2. Overload warning switch
The overload warning switch activates the overload warning system.

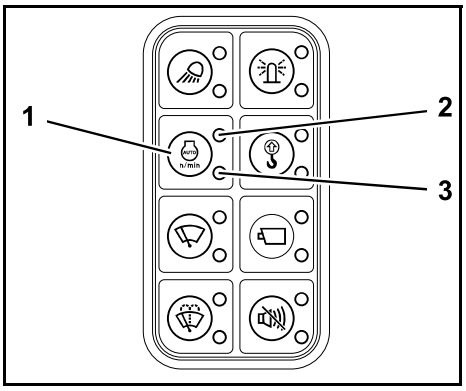
3. Camera switch
Displays image of camera on the display.

4. Without function
-

5. Washer switch
Switches the washer system.

6. Wiper switch
Switches on the wiper for the front window.

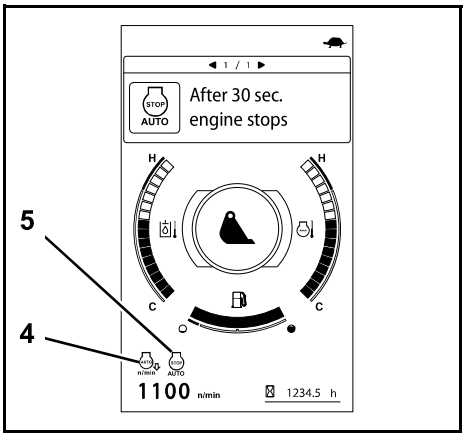
7. AUTO IDLE switch
Using the switch you can switch the AUTO IDLE control on, switch the engine auto-stop control on, or switch both of them off.



Press once: The AUTO IDLE control activates.
The upper indicator (2) lights up.
The AUTO IDLE indicator (4) appears on the display.

Press twice: The engine auto-stop control activates.
The upper indicator (2) and the lower indicator (3) light up.
The AUTO IDLE indicator (4) and the engine auto-stop indicator (5) appear on the display.

Press three times: The AUTO IDLE and engine auto-stop turn off.
The upper indicator (2) and the lower indicator (3) go out.
The AUTO IDLE indicator (4) and the engine auto-stop indicator (5) disappear.



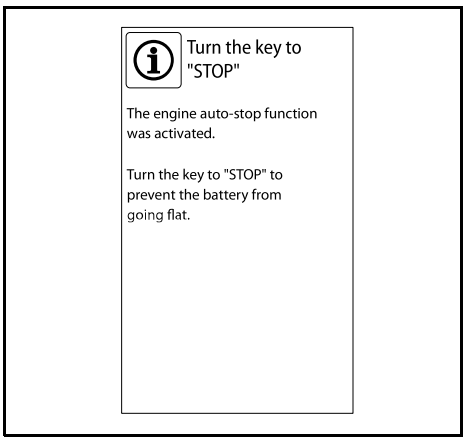
Even if the starter switch is turned to the RUN position, the selected mode remains the same.

The AUTO IDLE control ensures that the engine speed pre-selected with the potentiometer drops down to idle speed after approx. 4 seconds - provided that no controls are being used. Upon activating any of the controls, the engine speed will be immediately set to the preselected speed.

The engine auto-stop control stops the engine when there is no operation for a certain period of time while idling. To enable the engine auto-stop, set the function to on (page 80).

First, the engine speed pre-selected with the potentiometer drops down to idle speed after approx. 4 seconds - provided that no controls are being used. After the time set in auto-stop setting has passed, the engine stops automatically.

The warning screen is displayed 30 seconds before the engine stops.
After the engine stops, a message will appear on the display as shown in the figure on the right. To restart the engine, turn the starter switch once to the OFF position.
After 3 minutes, the electrical equipment will turn off.



You can operate the working light until the electrical equipment turns off.

The engine auto-stop function activates when:
- the engine is running.
- the attachment control lock lever is locked.
- the display and keypad switch are not in use.
- the machine is not overheated.
- the machine is not preheated.
- the overload warning system is not activated.
- the particle filter is not regenerated.

8. Instrument lighting/working lights switch
Switches the instrument lighting/working lights on or off.

9. Return switch
The current display gets interrupted and goes back to the previous one.

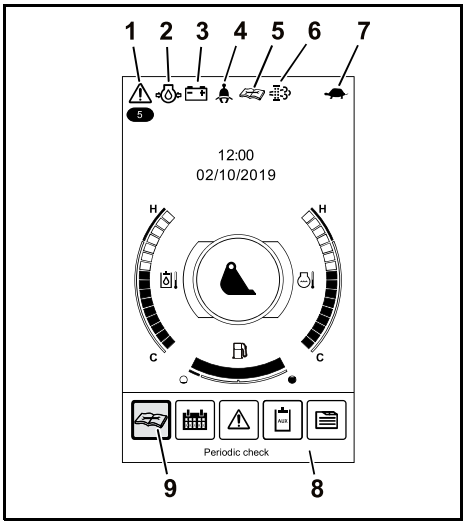
10. Menu switch
The menu bar gets displayed.

11. Jog dial and Enter key
An item gets selected and saved through display operation.

Display

The display contains the following displays and indicators:

1. Warning light
2. Engine oil pressure indicator
3. Charge indicator
4. Seat belt indicator
5. Maintenance indicator
6. DPF-related indicator
7. Travel speed indicator
8. Menu bar
9. Cursor



Description of the display

The display is multifunctional. You will find detailed descriptions of the individual functions in the respective chapters.

1. **Warning light**
   The warning light flashes red when a system fault or technical malfunction occurs. The warning light flashes yellow when the system issues a warning.

Operations must cease immediately when the warning light flashes red.

2. **Engine oil pressure indicator**
   The engine oil pressure indicator lights up when the oil pressure is below the reference value.

3. **Charge indicator**
   The charge indicator lights up when the charging circuit voltage is too low.

4. **Seat belt indicator**
   The seat belt indicator lights up if the seat belt is unbuckled.

5. **Maintenance indicator**
   The maintenance indicator lights up when a service period is due.

6. **DPF-related indicator**
   Depending on situations, the DPF-related regeneration status, rpm boost command or regeneration disable indications are displayed.

7. **Travel speed indicator**
   Travel speed mode is displayed.

8. **Menu bar**
   Move the cursor (9) to the desired icon and press the enter key. The desired setting will appear.

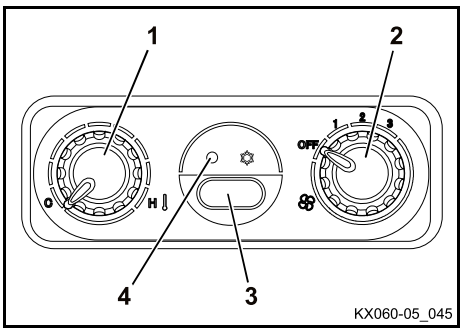
Other equipment at the operator's place

Other equipment located at and around the operator's place is described below.

Heating and air-conditioning system

The heating controls are on the right control console. The control panel includes the following components:

1. Temperature control
2. Blower switch
3. Air-conditioner switch
4. Indicator



Using the air-conditioner switch, you can switch on the air-conditioner when the starter switch is in the RUN position and the fan is switched on. Operation of the air-conditioner system is indicated by the indicator.

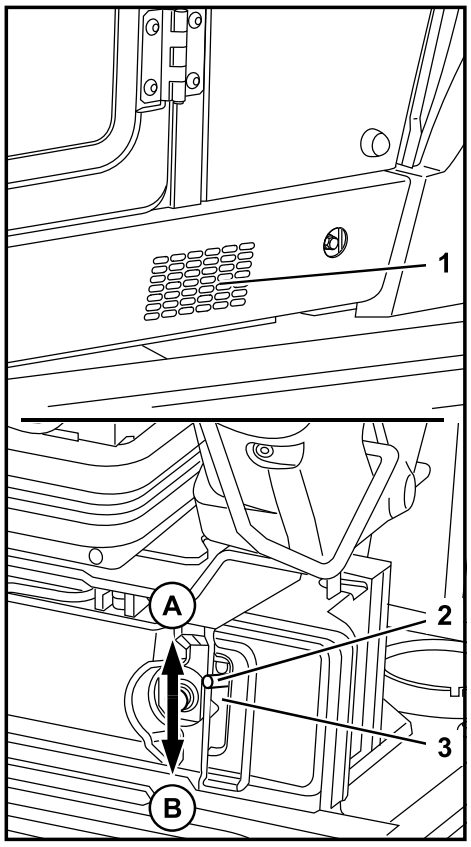
Using the temperature control, you can set the air temperature to the desired value.

Using the blower switch, you can control the air flow in three stages, with stage 3 having the maximum air flow.

The air is drawn in through an interior air filter, either as fresh air via the air intake (1) to the left of the cab or as re-circulated air via the lever console (3) in the cab.

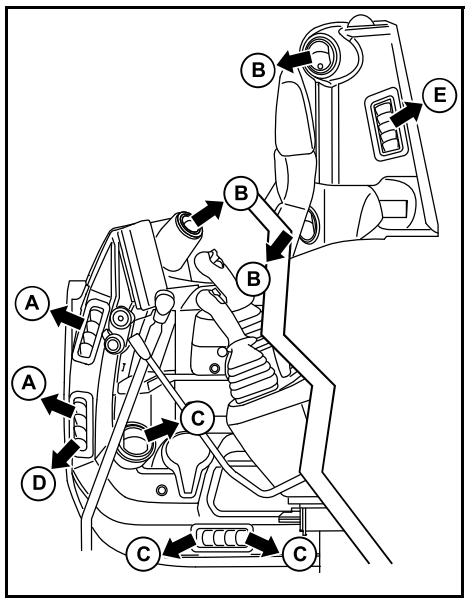
The lever (2) can be used to switch the air intake between recirculated air (A) and fresh air (B).

To assure proper ventilation, do not obstruct the air inlet with objects (such as bags or clothes).



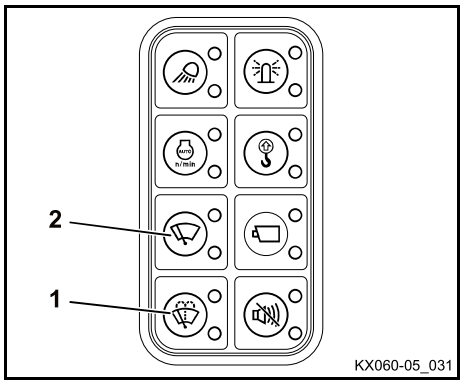
The air is conducted via the heat exchanger and/or the evaporator of the air-conditioner assembly to the air nozzles.

(A) Windshield
(B) Operator
(C) Leg room
(D) Side window
(E) Rear window

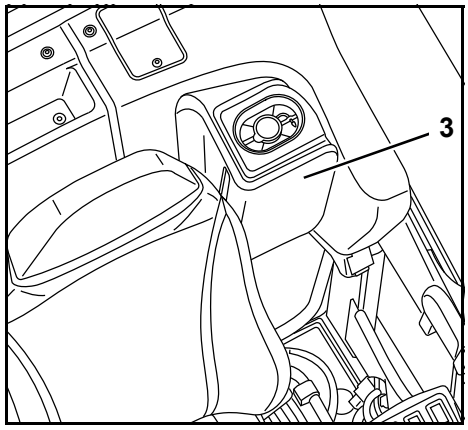


Wiper/washer system

The front window is provided with a wiper/washer system. The system is operated with the washer switch (1) and wiper switch (2).

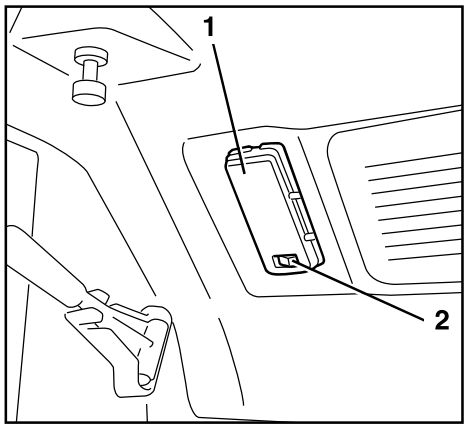


The washer system reservoir (3) is located to the left behind the operator's seat.



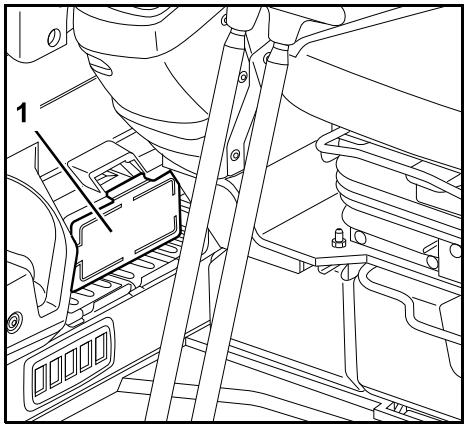
Interior lighting

An interior light (1) is located to the right of the cab roof. Use the switch (2) to turn it on and off.



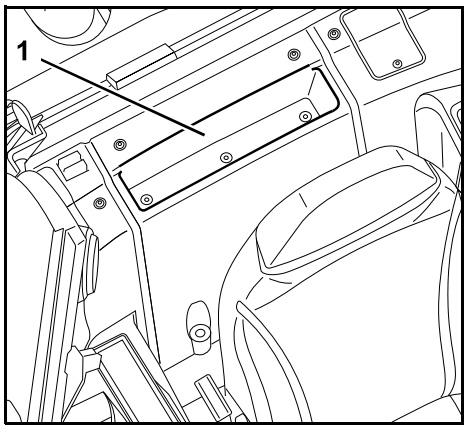
Fuse box

The fuse box (1) is located behind the right-side cover in the cabin.



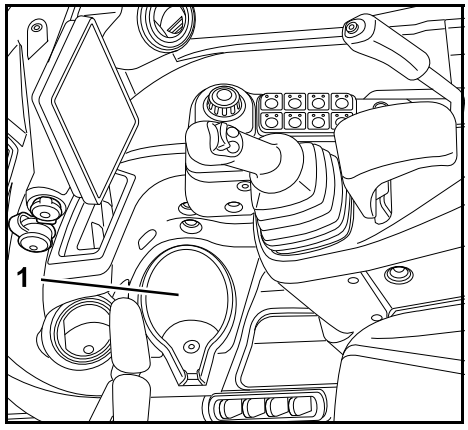
Glove box

The glove box (1) is located behind the operator's seat.



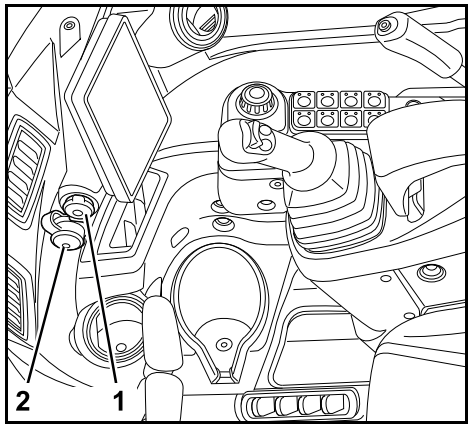
Cup holder

There is a cup holder (1) in the right control console.



12-V electrical outlet and USB outlet

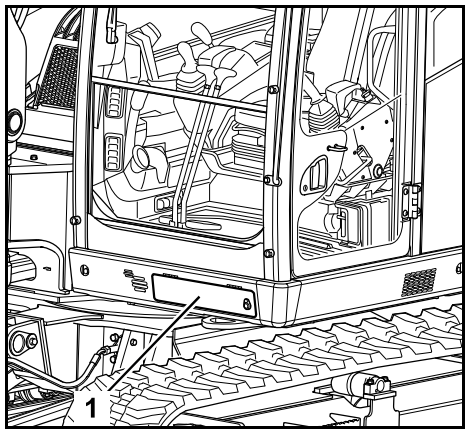
A 12-V electrical outlet (1) and an USB (Type-A) outlet (2) for the connection of an external electric device are located on the right-hand side control console.



Other equipment to be found on the machine

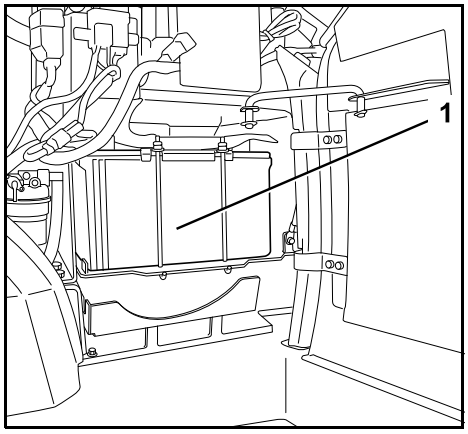
Tool compartment

The tool compartment (1) is located on the front side of the vehicle under the cab.



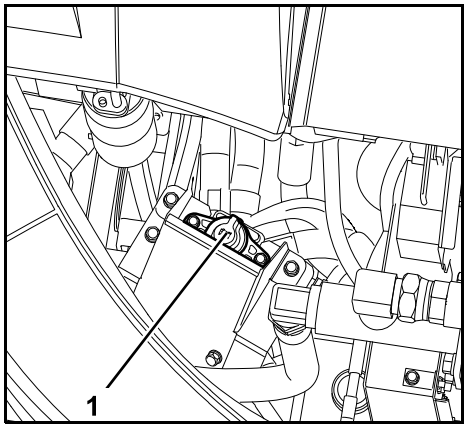
Main battery

The main battery (1) is located on the right-hand side of the vehicle under the side cover.



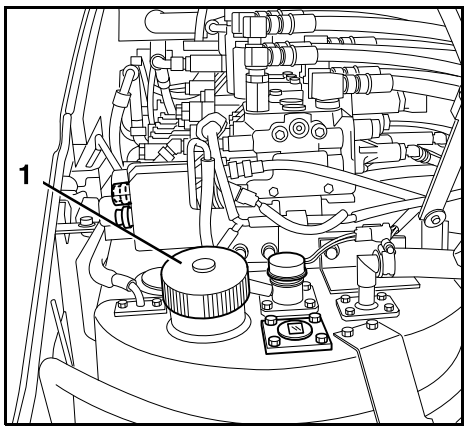
Battery isolator

The battery isolator (1) can be used to cut off the main power circuit. The battery isolator is on the right vehicle side under the side cover.



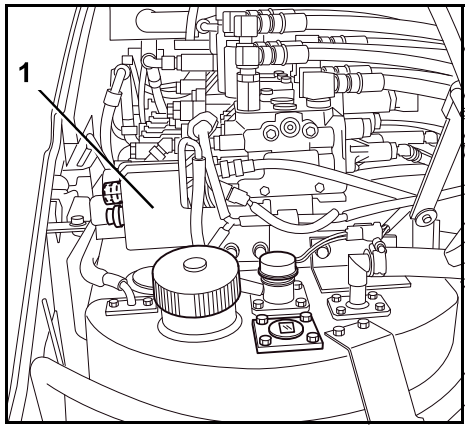
Tank filler neck

The tank filler neck (1) is located under the valve compartment cover on the right of the machine.



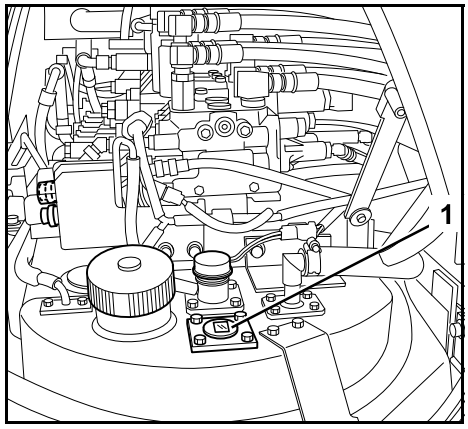
Suction pump switch

The machine is equipped with a suction pump. The suction pump switch (1) is located under the valve chamber cover on the right-hand side of the vehicle.



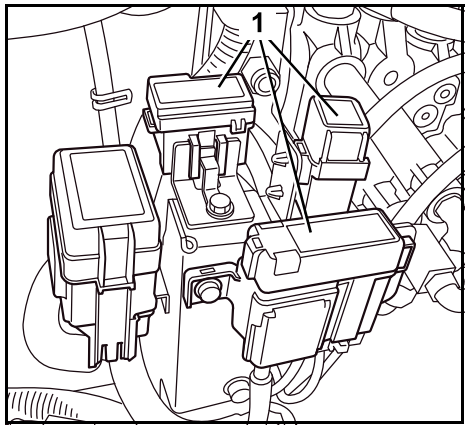
Fuel gauge

The machine is equipped with an additional fuel gauge. The fuel gauge (1) is located under the valve chamber cover on the right-hand side of the vehicle.



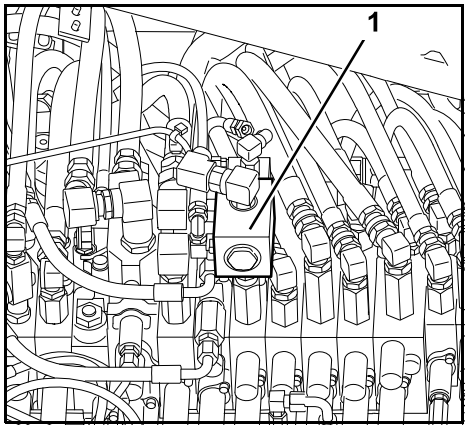
Main fuses

The main fuses (1) of the machine are situated above the battery.



Return change valve for direct return flow

According to the mode of operation of a given attachment, the return flow of the hydraulic oil must occur either via the control valve (indirect return flow) or directly to the hydraulic oil tank (direct return flow).
The change valve direct return flow (1) is used to toggle the setting between "indirect return flow" and "direct return flow".
The return change valve for direct return flow (1) is located under the valve chamber cover on the right-hand side of the vehicle.

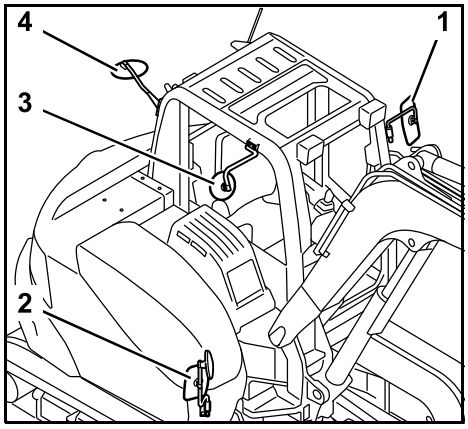


Rear view mirror

The front rear view mirrors (1, 2, 3) allows visibility to the rear. The rear view mirrors can be adjusted for optimum visibility of the respective areas.

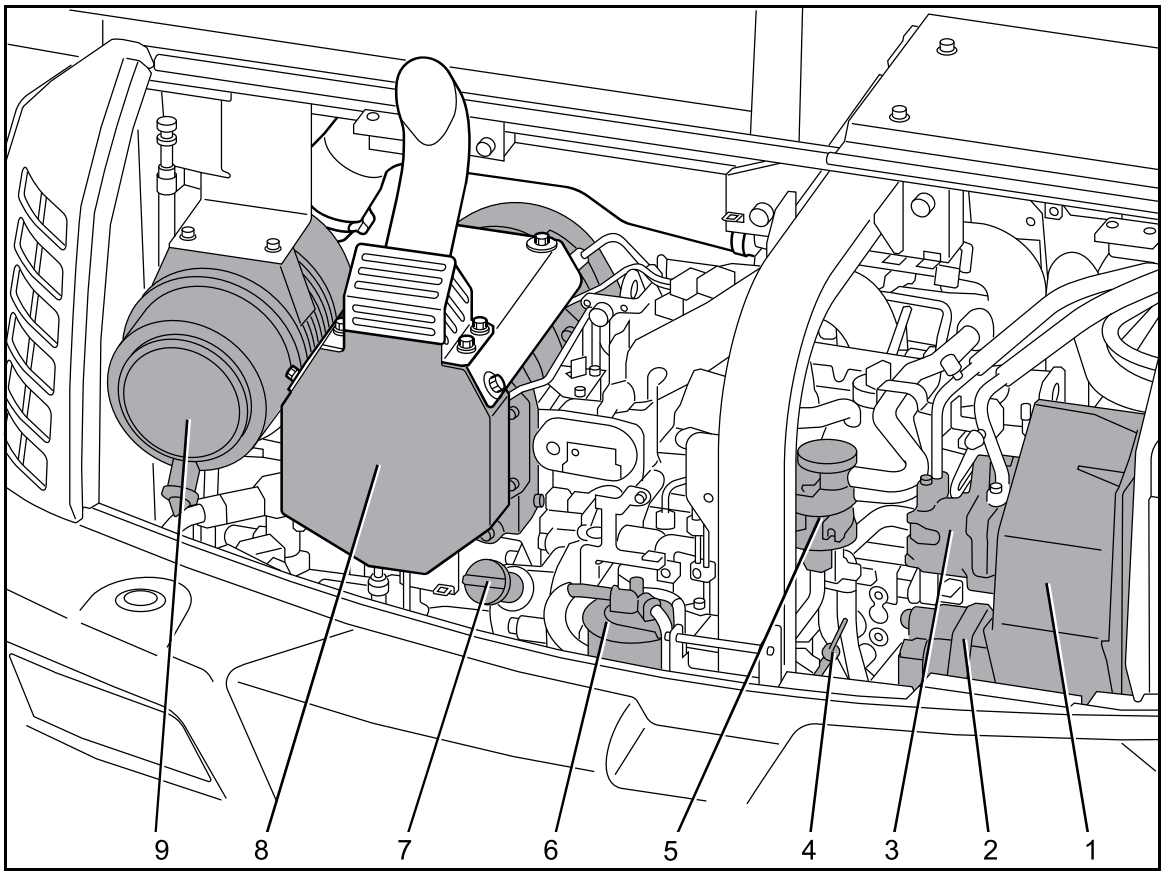
To see the right rear area with mirror widely, use the round mirror (3) on the right side of the cabin.
Use the rectangular mirror (2) on the hood only for the right rear close-up area.

When the operator turns around in the operator's seat, the rear view mirror (4) grants him a view of what is directly behind the back of the machine.



Engine compartment

The engine compartment (figure below) is positioned at the rear of the swivel frame; it is covered by a lockable hinged cover.



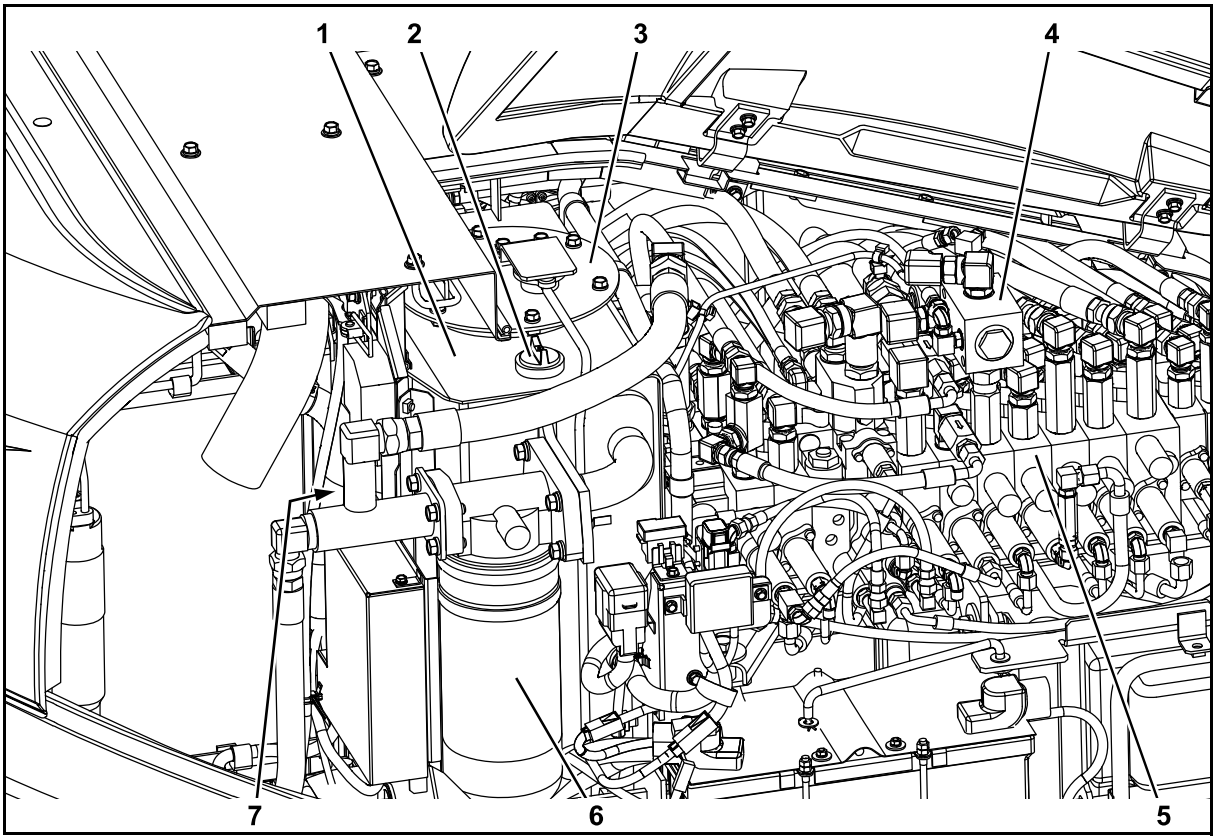
1. V-belt cover
2. Alternator
3. Compressor (A/C)
4. Oil dipstick
5. Oil separator
6. Fuel filter
7. Oil filler opening
8. Diesel particle filter muffler/diesel particle filter
9. Air filter

Hydraulic system

All controls enable the functions via a hydraulic oil pilot control circuit.

An accumulator allows the boom and the arm to be lowered in case of an engine failure.

The hydraulic oil tank contains the suction filter. The return filter is mounted to the outside of the hydraulic oil tank.

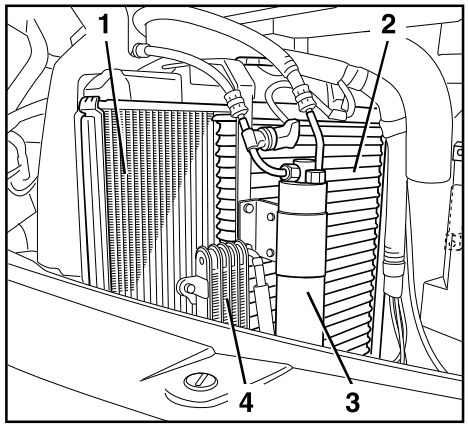


1. Hydraulic oil tank
2. Plug
3. Hydraulic oil tank cap
4. Return change valve for direct return flow
5. Control valve
6. Return Filter
7. Sight glass for hydraulic oil level

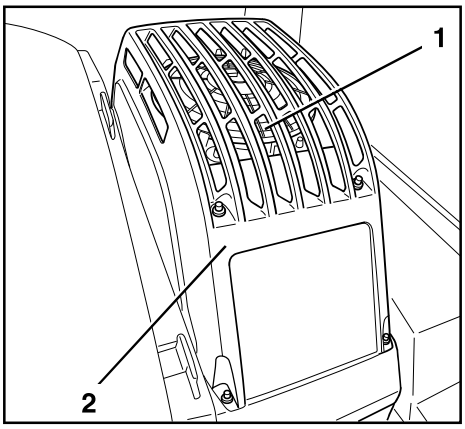
Coolant radiator and oil cooler (A/C condenser)

The cooling circuit radiators are located on the right-hand side of the engine compartment.

1. Coolant radiator
2. Hydraulic oil radiator
3. Liquid reservoir and dryer (air-conditioner)
4. Fuel cooler



The A/C condenser (1) is located under a protection cover (2) on the right-hand side of the cab.



OPERATION

Safety rules for operation

- The safety instructions (page 17) must be followed.
- The machine may only be operated according to its approved use (page 19).
- The machine may only be operated by instructed or trained personnel (page 14).
- Do not operate the machine when under the influence of drugs, medication or alcohol. Stop operation when getting tired. The operator must be physically capable of operating the machine safely.
- Do not operate the machine when there is a possibility of lightning. Even if the machine is equipped with a cabin, the operator is not protected from lightning.
- The machine should only be operated if all protective devices are fully operational.
- Before starting or working with the machine, make sure that there is no danger for any person nearby.
- Before starting the machine, it must be checked for external damage and operability, and the pre-start checks must be carried out. If damage is detected, the machine should only be put into operation after the damage has been repaired.
- Wear tight-fitting working clothes in accordance with the trade association regulations.
- During the operation of the machine, nobody except the operator is allowed to be inside the cab or get on the machine.
- For getting on and off, the swivel frame should be positioned in an angle that allows the operator to use the crawler or the step (if applicable) to enter the cab.
- Always stop the engine when leaving the cab. In exceptional cases, e.g. for troubleshooting, the cab can also be left with the engine running. The operator must make sure that the left control console remains in an upright position. The controls may only be used while the operator is sitting on the operator's seat.
- During operation, it is forbidden to stretch any part of the body out of the window or cab door, such as arms, legs, or the body.
- If the operator leaves the machine (e.g. for breaks or at the end of work), the engine must be stopped and the machine must be secured against restarting by removing the key. The cab door must be locked. Before leaving the machine, park the machine so that it cannot move.
- Whenever work is interrupted, the bucket must always be lowered to the ground.
- Do not allow the engine to run indoors, unless the room is equipped with an exhaust gas extraction system or otherwise well ventilated. The exhaust gas contains carbon monoxide, a colourless, odourless, and lethal gas.
- Never crawl under the machine before the engine is stopped, the key is removed and the machine is secured against moving.
- Never crawl under the machine if it is only raised with the bucket or the dozer. Always use suitable supports.
- To increase the machine’s stability, we recommend lowering the dozer onto the ground. The dozer may only be used to increase stability if the dozer cylinder is equipped with a pipe safety valve. The dozer control lever must not be moved into floating position in the process. The machine’s stability is not increased by the dozer while in the floating position.

Safety for children

Children are normally attracted to machines and their operation. If children are in the vicinity of the machine and are not at a suitable distance and in the field of vision of the operator, this can lead to serious accidents or even death of the children.

Always observe the following rules of conduct:

- Never assume that children will remain where you last saw them.
- Keep children far away from the working area and always under the supervision of other responsible adults.
- Be vigilant and switch the machine off when children enter the working area.
- Never let children drive with you on your machine, there is no safe place for passengers. Children could fall off the machine and be run over or affect the control of the machine.
- Children must never operate the machine, even under the supervision of an adult.
- Never let children play on the machine or attachments.
- Be particularly careful when manoeuvring. Look behind and down below on the machine and ensure that there are no children in the manoeuvring area.
- Prior to leaving the machine (e.g. for breaks or at the end of work) if at all possible park the machine on a firm, flat and level ground, lower the attachment to the ground, place all control levers into neutral, switch off the engine and prevent the machine from being restarted by taking the key.

Guiding the operator

- If the operator's working and driving area is obscured, the operator must be supported by a guide.
- The guide must be capable of performing this kind of work.
- Before starting work, the guide and the operator must agree on the necessary signals.
- The guide's position must be clearly visible to the operator.
- The operator must stop the machine immediately if eye contact with the guide is interrupted.
  → As a rule, either the machine or the guide may move, never both at once!

Working in the vicinity of overhead power lines

When working with the machine in the vicinity of overhead power lines and tram lines, a minimum distance as specified in the following table must be maintained between the machine and its attachments and the power line. The owner of the machine or the person responsible for the work must ensure local, regional and national regulations are observed.

Rated voltage		Safe distance
	up to 1 kV	1.0 m
over 1 kV	up to 110 kV	3.0 m
over 110 kV	up to 220 kV	4.0 m
over 220 kV	up to 380 kV or when rated voltage is unknown	5.0 m

If safe distances cannot be maintained, the power lines must be switched off in coordination with their owner or provider and secured against turning on again.

When approaching overhead power lines, any possible movements of the machine must be taken into consideration.

Unevenness of the ground or sloping the machine can reduce the safe distance.

Wind can cause the overhead power lines to sway, thus reducing the safe distance.

In case of a power cross-over, leave the danger zone with the machine, if possible, by taking suitable measures. If this is not possible, do not leave the operator's place, warn any approaching persons of the danger, and have the power switched off.

Working in the vicinity of underground power lines

Before starting with excavation work, the owner of the machine or the person responsible for the work must check if there are any underground power lines in the proposed working area. The owner of the machine or the person responsible for the work must ensure local, regional and national regulations are observed.

If there are underground power lines present, the position and routing of the power lines must be determined together with the owners or operators and the required safety measures must be determined.

If power lines are encountered or accidentally damaged, the operator must stop working immediately and inform the responsible person.

Initial operation

Before initial operation, the machine must first be checked visually for external transit damages and checked if the shipped equipment is complete as ordered.

- Check fluid levels as described in the "Maintenance" section (page 165).
- For a description of all operation features refer to the "Operating the machine" section (page 83) as well as the following sections.

If malfunctions are detected, please inform your authorised KUBOTA dealer immediately.

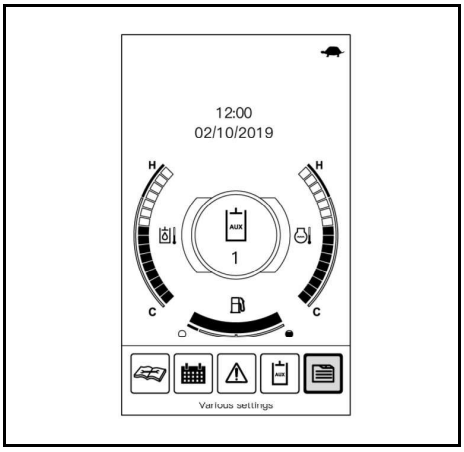
Setting the display language

Messages in the display can be shown in 11 languages.

- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

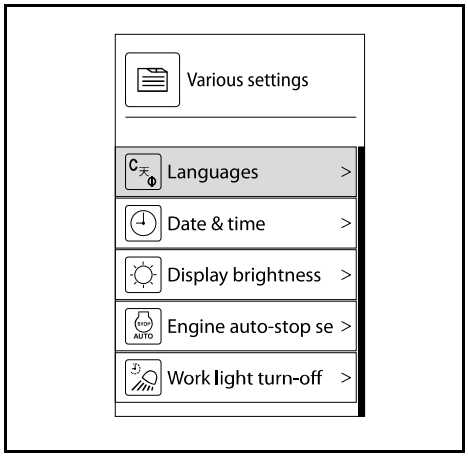
The menu bar appears in the display.

- Rotate jog dial to the right until “Various settings” is selected in the display.
- Press Jog dial (enter switch).



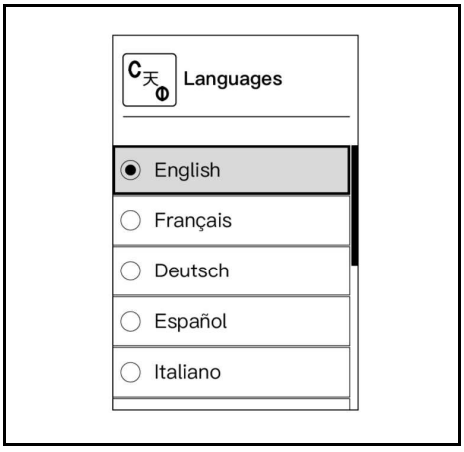
The Various settings appears in the display.
(“Languages” is selected.)

- Press Jog dial (enter switch).



The list of available languages appears in the display.

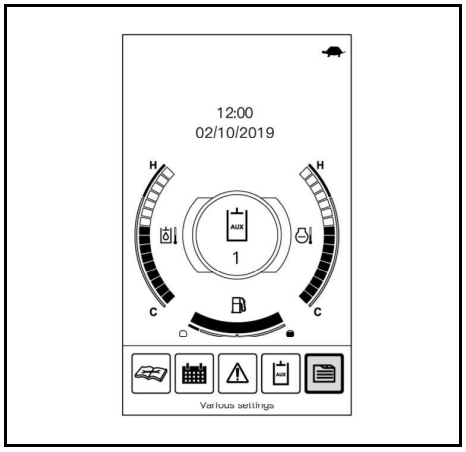
- Rotate jog dial to the right or the left until the desired language is selected.
- Press jog dial (enter switch) to confirm.



Setting the date/time

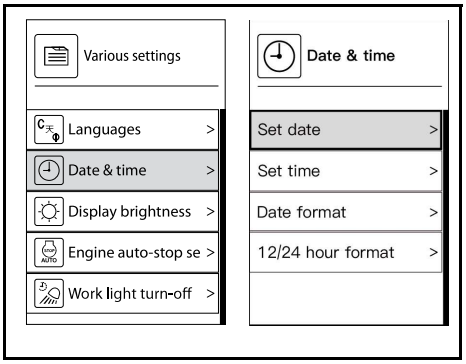
- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

The menu bar appears in the display.



- Rotate jog dial to the right until “Various settings” is selected in the display.
- Press Jog dial (enter switch).

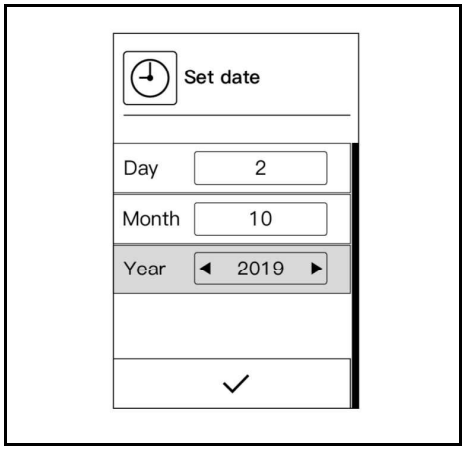
The Various settings appears in the display.



- Rotate jog dial to the right until “Date & time” is selected in the display.
- Press Jog dial (enter switch).

The “Date & time” menu appears in the display.

- Rotate jog dial to the right or the left until “Set date” / “Set time” is selected.
- Press Jog dial (enter switch).
- “Set date” / ”Set time” screen appears in the display.
- Rotate jog dial to the right or the left until the desired unit is selected.
- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left to decrease or increase the numerical value.
- Press jog dial (enter switch) to confirm the desired unit.
- Rotate jog dial to the right or the left until ✓ (icon of acknowledge) is selected in the display.
- Press jog dial (enter switch) to complete “Set date” / “Set time”.



Input can be cancelled at any time. Changes are then not saved.

- To cancel your input, press return switch.

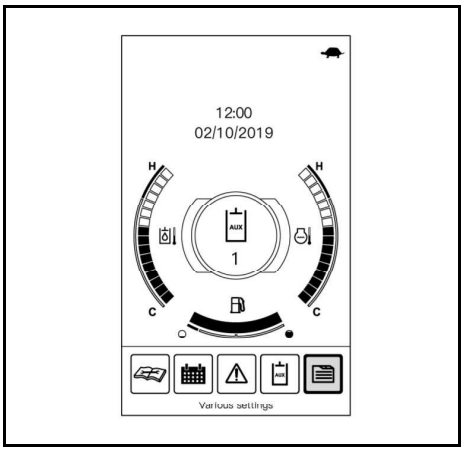
The display returns to its previous display mode.

Date and time display format

Time can be displayed in the 12- or 24-hour format, while the date format can be changed to day, month, year.

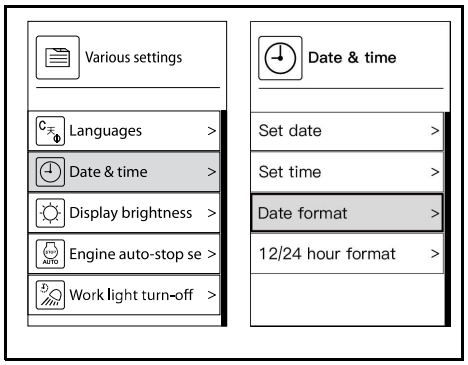
- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

The menu bar appears in the display.



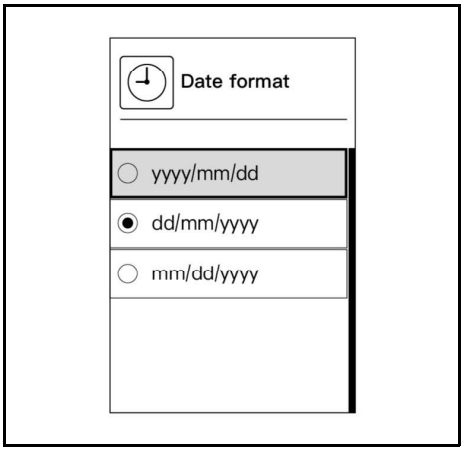
- Rotate jog dial to the right until “Various settings” is selected in the display.

Press Jog dial (enter switch).



- The Various settings appears in the display.
- Rotate jog dial to the right until “Date & time” is selected in the display.
- Press Jog dial (enter switch).
- The “Date & time” menu appears in the display.
- Rotate jog dial to the right or the left until “Date format” / “12/24 hour format” is selected.
- Press Jog dial (enter switch).

“Date format” / “12/24 hour format” setting screen appears in the display.



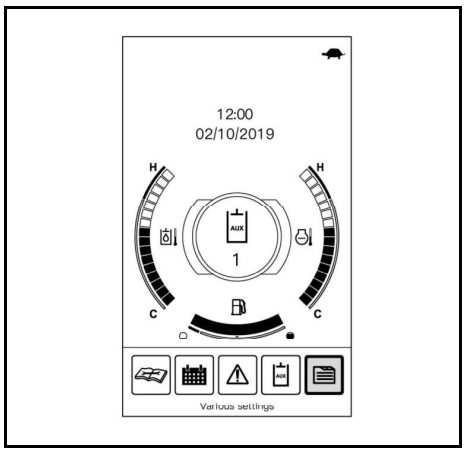
- Rotate jog dial to the right or the left until the desired format is selected.
- Press jog dial (enter switch) to confirm.

Setting the display brightness

The display brightness is presettable in 10 levels. This brightness setting can be made separately for the working light turn-on and turn-off states.

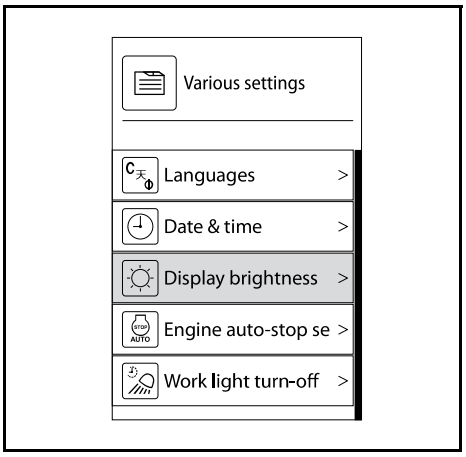
- Press menu switch on dial switch.

The menu bar appears in the display.



- Rotate jog dial to the right until “Various settings” is selected in the display.
- Press Jog dial (enter switch).

The Various settings appears in the display.



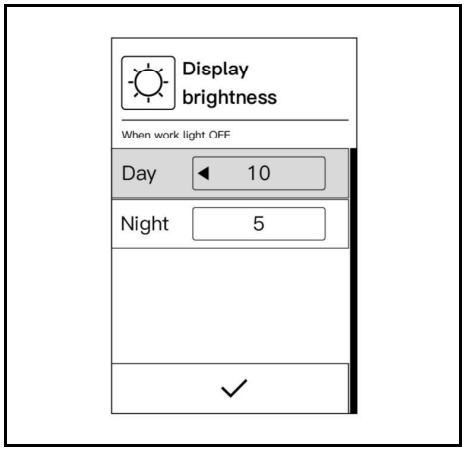
- Rotate jog dial to the right until “Display brightness” is selected in the display.
- Press Jog dial (enter switch).
- “Display brightness” setting screen appears in the display.
- Rotate jog dial to the right or the left until the desired mode is selected.

The “Day” brightness setting is for the working light turn-off state, and the “Night” one is for the working light turn-on state.

Default setting:

Day: 10

Night: 5



- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left to increase or decrease the numerical value.
- Press jog dial (enter switch) to confirm the desired mode.
- Rotate jog dial to the right until ✓ (icon of acknowledge) is selected in the display.

- Press jog dial (enter switch) to complete “Display brightness” setting.

Input can be cancelled at any time. Changes are then not saved.

- To cancel your input, press return switch.

The display returns to its previous display mode.

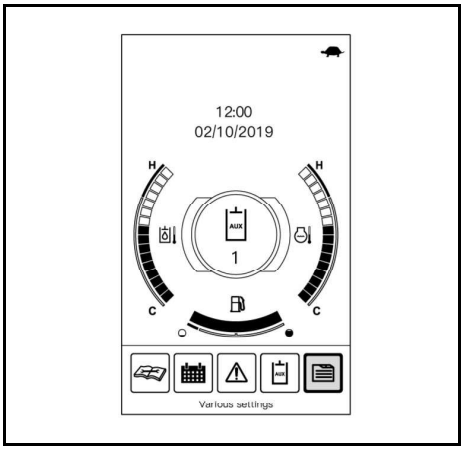
Setting the engine auto-stop function

The time until the engine auto-stop function is activated can be set.

- Press menu switch on dial switch.

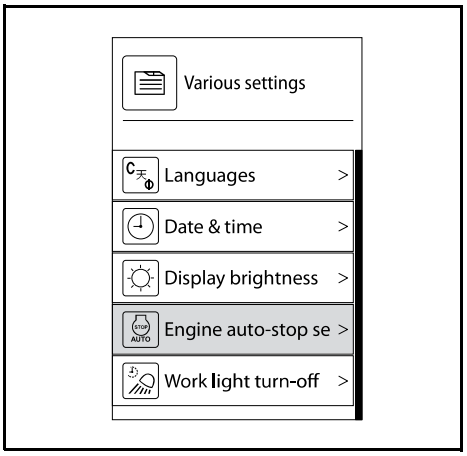
The menu bar appears in the display.

- Rotate jog dial to the right until “Various settings” is selected in the display.
- Press Jog dial (enter switch).

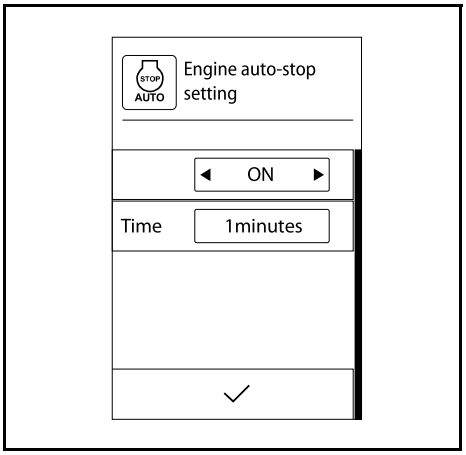


The Various settings appears in the display.

- Rotate jog dial to the right until “Engine auto-stop setting” is selected in the display.
- Press Jog dial (enter switch).



"Engine auto-stop setting" screen appears in the display.



- Rotate jog dial to the right or the left until the desired item is selected.
- Press jog dial (enter switch) to confirm the desired item.

Before making a "Time" setting, enable the "Engine auto-stop" function.
The "Time" setting can be set to 1, 3, 5, 10, 15, 20, 25 or 30 minutes.

- Rotate jog dial to the right or the left until ✓ (icon of acknowledge) is selected in the display.
- Press jog dial (enter switch) to complete "Engine auto-stop" setting.

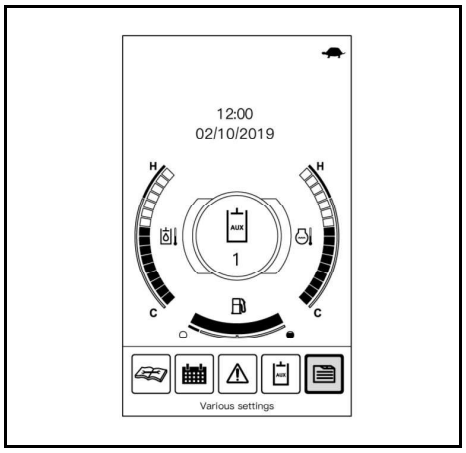
Input can be cancelled at any time. Changes are then not saved.

- To cancel your input, press return switch.

The display returns to its previous display mode.

Setting the work light turn-off delay function

The working light turn-off can be delayed for a given time after turning off the key. To turn off the working light in preference to this turn-off delay function, you may use the working light switch.



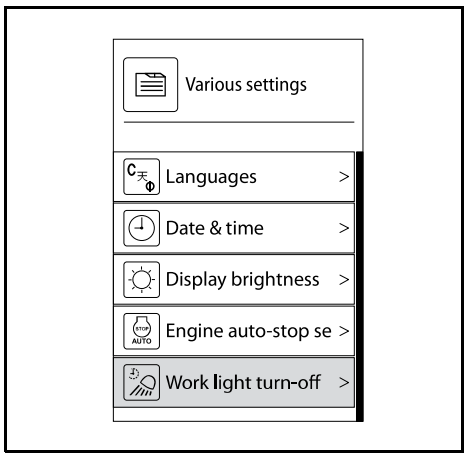
- Press menu switch on dial switch.

The menu bar appears in the display.

- Rotate jog dial to the right until "Various settings" is selected in the display.
- Press Jog dial (enter switch).

The Various settings appears in the display.

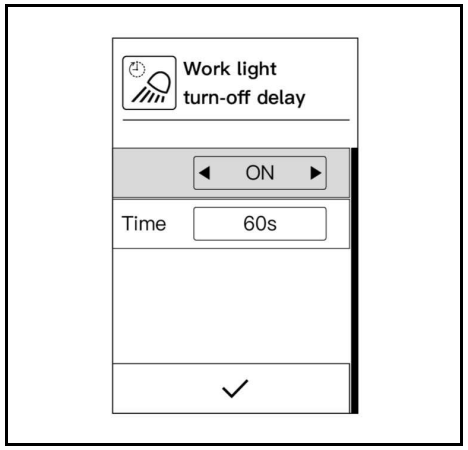
- Rotate jog dial to the right until “Work light turn-off delay” is selected in the display.
- Press Jog dial (enter switch).



“Work light turn-off delay” setting screen appears in the display.

- Rotate jog dial to the right or the left until the desired item is selected.
- Rotate jog dial to the right or the left to select ON/OFF or the delay time.
- Press jog dial (enter switch) to confirm the desired item.

Before making a “Delay time” setting, enable the “Work light turn-off delay” function.
The “Delay time” setting can be made in 30-second increments from 30 up to 120 seconds.



- Rotate jog dial to the right or the left until ✓ (icon of acknowledge) is selected in the display.
- Press jog dial (enter switch) to complete “Work light turn-off delay” setting.

Input can be cancelled at any time. Changes are then not saved.

- To cancel your input, press return switch.

The display returns to its previous display mode.

Running-in of the machine

During the first 50 hours of operation, the following points should be adhered to in all cases:

- Warm up the machine at an average engine speed and with a low load; do not let it warm up at idling position.
- Do not overload the machine.

Special maintenance instructions

Damage to equipment due to contaminated grease!
The grease plays a particular and important role in the running-in of the machine. The movable components are not yet broken in and generate many fine particles in the initial hours of operation that drop into the grease. Changing the oil in due time removes the abraded metal particles, prevents damage to equipment and preserves the service life of the components.

- *Observe and adhere to oil change intervals!*

- Change the oil in the final drives after the first 50 service hours.
- The hydraulic system's return filter should be changed after the first 250 service hours.

Operating the machine

For a safe machine operation, see the following sections.

Pre-operational services

For the performance of the services, the machine must be parked on level ground and the key must be removed.

- Open the side cover (page 150).
- Open the engine compartment cover (page 149).
- Open the valve chamber cover (page 149).

Close all covers after the work has been done.

Walk-around inspection

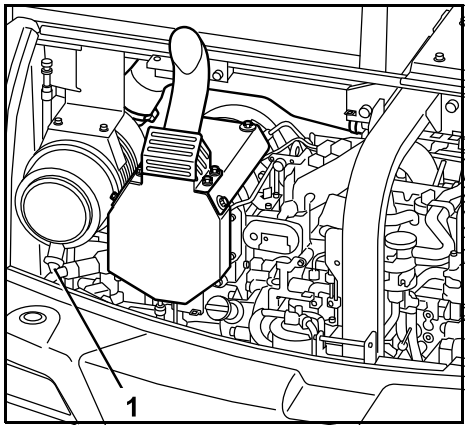
- Check the machine for visible damage, loose nuts and screws and leaks.
- Check for any accumulated dirt adjacent to hot components, e.g. engine, diesel particulate filter muffler, exhaust manifold/tubes and remove if necessary.

Check the hot parts for a buildup of flammable materials on and around them. It may lead to a fire.

- Check for accumulated residues from leaves, straw, pine needles, twigs, bark and other flammable materials and remove if necessary.
- Check the safety labels on the machine. They must be complete and legible (page 22).
- Ensure that the emergency hammer is present (page 34).

Dust valve - clean

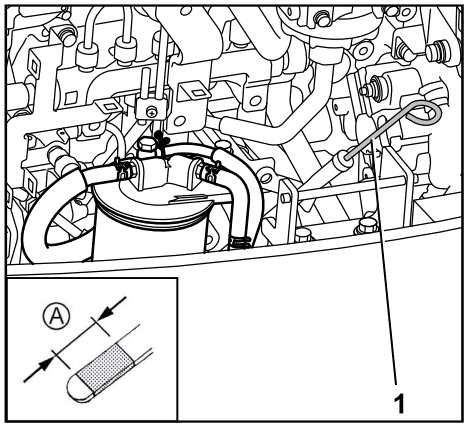
- Empty the dust valve (1) by pressing it together several times.



Engine oil level - check

- Pull out the oil dipstick (1) and wipe it with a clean cloth.
- Insert the oil dipstick completely and pull it out again. The oil level should be in the "A" area. If the oil level is too low, top up the engine oil (page 181).

If the oil level is too high or too low, the engine might become damaged during operation.



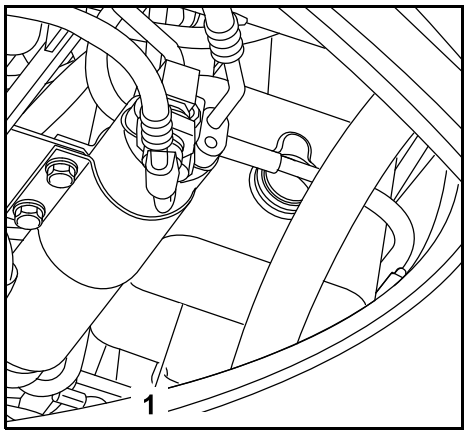
Coolant level - check

- Check the coolant level in the expansion reservoir (1). The fluid level must be between FULL and LOW.

STOP

Do not open the radiator cap.

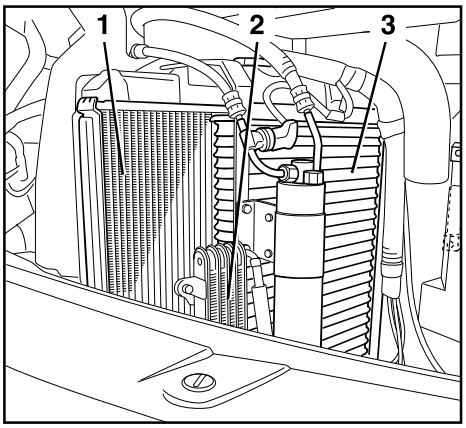
If the coolant level is below the LOW mark, refill coolant (page 175).



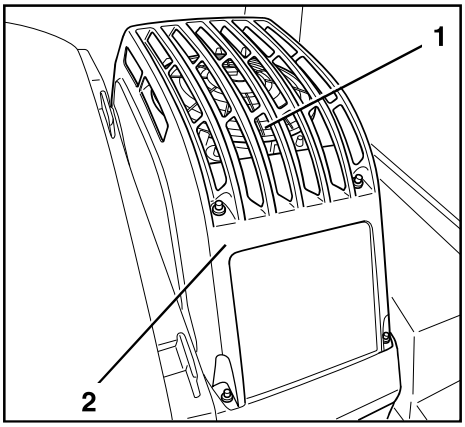
If the coolant level is below the LOW mark a short time after adding coolant, then the cooling system is leaky. The machine may only be started again after the leak is repaired.

Coolant radiator and oil cooler (A/C condenser) - check

- Perform a visual inspection of the coolant radiator (1), the fuel cooler (2), and the hydraulic oil cooler (3) for leaks and accumulation of dirt and debris.



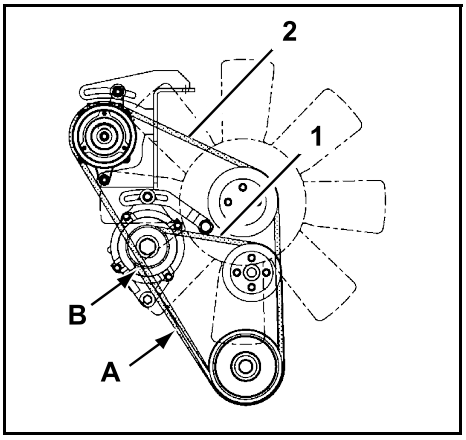
- Perform a visual inspection of the condenser (1) for tightness and soiling.
- If there is mud or debris at the radiators or the condenser, clean the radiators and condenser (page 176). Remove the protection cover (2) if necessary (page 176).



V-belt - check

The engine must be switched off and the key removed!
Do not attempt to grasp rotating or moving parts.

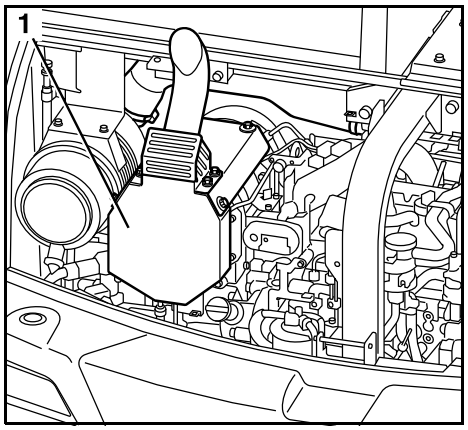
- Press in the V-belt (1) at position "A". The V-belt must give way for approx. 10 mm (pressure: 10 kg). Adjust the V-belts if necessary (page 177).
- Press in the V-belt (2) at position "B". The V-belt must give way for 12 to 15 mm (pressure: 7 kg). Adjust the V-belts if necessary (page 177).
- Check both V-belts for wear and tear. Replace the V-belts if necessary (page 177).



Exhaust system leakage - check

Risk of burns!
Make sure that the engine has stopped and the exhaust system has cooled down.

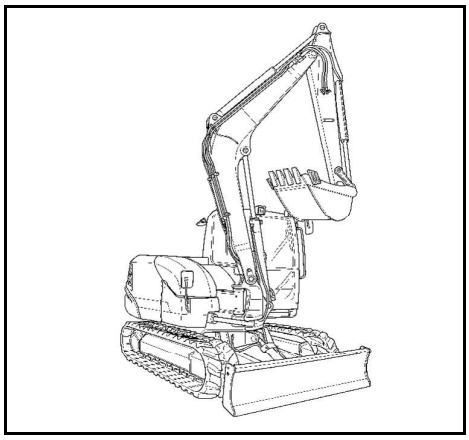
- Check the exhaust system for leaks and security (formation of cracks)
- If the exhaust system is leaky or loose, the machine may only be taken into operation after repair.
- Check the exhaust system and the area surrounding the diesel particle filter (1) for flammable materials such as oil deposits, cloths, leaves, etc. and clean if necessary.



Hydraulic oil level - check

The following conditions must be met in order to determine the exact hydraulic oil level.

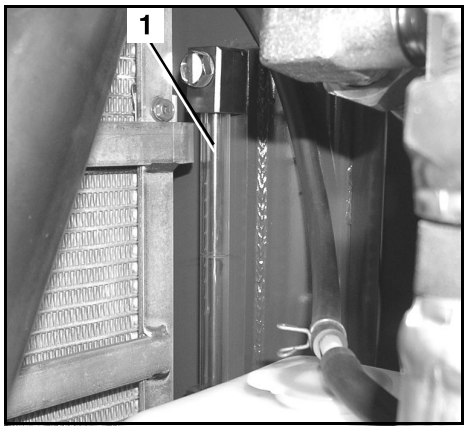
– The temperature of the hydraulic oil is between 10 °C and 30 °C.
– The hydraulic cylinders for the boom, arm, and bucket have been extended completely.
– The dozer has been lowered to the ground.
– The swing mechanism has been swivelled fully to the left.



- Check the oil level in the sight glass (1).

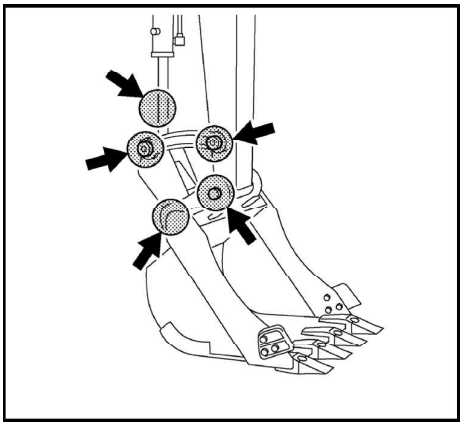
The oil level should be halfway up the sight glass.

- Carefully check the position of the hydraulic cylinders before topping up the oil. For more information see section "Topping up/changing the hydraulic oil" (page 193).



Bucket bolt and bucket linkage bolt - grease

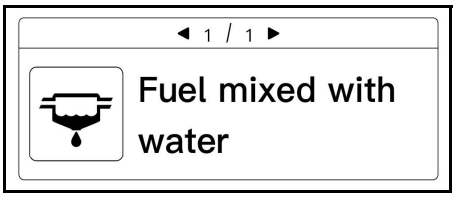
- Start the engine (page 94).
- Position the arm and bucket as shown in the figure. See the "Excavation work (operating the controls)" section (page 115).
- Stop the engine (page 97).
- Lubricate all greasing points (see figure to the right) – see the "Operating materials" section (page 210) – by injecting grease until fresh grease emerges.



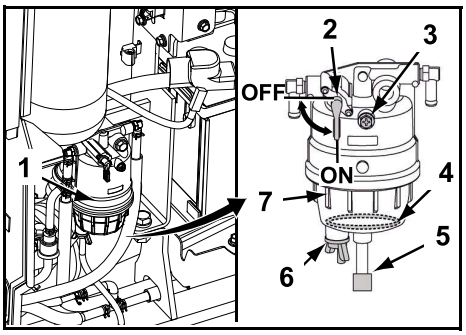
Wipe emerged grease off immediately and store dirty cleaning cloths in the containers provided for disposal.

Water separator - check

Water and impurities in the fuel settle in the water separator. The water separator is equipped with a sensor that checks the fill level. If any such deposits form, a message will appear on the display as shown in the figure on the right.



- Visual inspection of the water separator (1) for water and sediments.
- If the water separator is contaminated, empty the water separator (page 185).
- Make sure that the sensor cable plug (5) is connected.
- Switch the shut-off valve to the “ON” position.



Electrical equipment - check

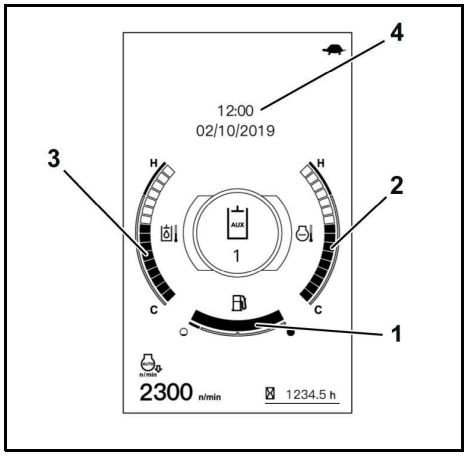
- Check the function of the interior light (page 136).
- Check the function of the working light (page 136).
- Check the function of the rotary beacon (optional equipment) (page 136).
- Check the function of the ventilation fan of the heater and air conditioner (optional) (page 132).
- Check the function of the washer system (page 135).

Fuel level, coolant temperature, hydraulic oil temperature, date and time - check

The following function can be carried out when the key is not in the starter switch.

The display shows the fuel level (1), the date and time (4), the hydraulic oil temperature (3) and the coolant temperature (2).

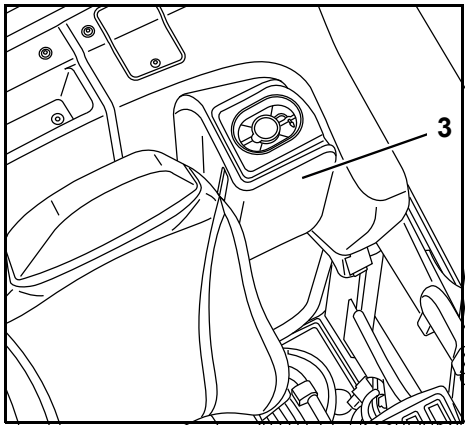
Alternatively, the fuel level can be read on the fuel gauge under the valve chamber cover.



Fluid level of the wiper/washer system (cab version) - check

- Check whether the washer system reservoir (3) is full enough.
- If the filling capacity is too low, fill the washer system reservoir (page 144).

Do not operate the washer system if its reservoir is empty as running dry could damage the pump.



Setting up the workplace

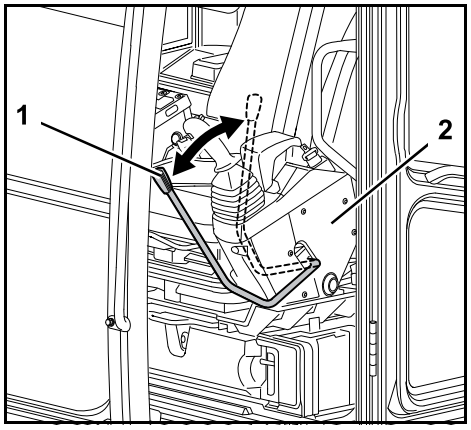
Please refer to the "Opening and closing the cab door" section (page 137).

Getting on the machine

- Move the left control console (2) up as far as possible by pulling the control lever lock (1) up.

The control console must remain in this position until the engine is started, as the engine can only be started in this position.

- Get on the machine by using the crawler or step as a stepping aid.
- Sit down on the operator's seat.

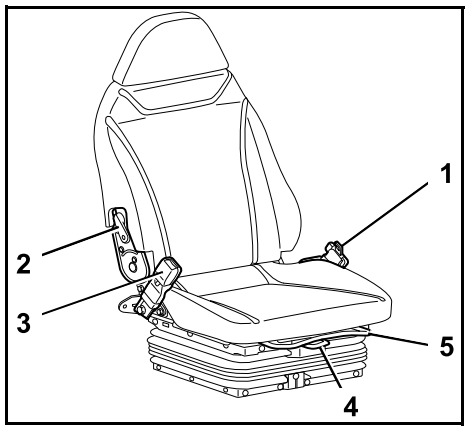


Adjusting the operator's seat

Adjust the operator's seat so that fatigue-free and comfortable working is possible. It should be possible to operate all controls safely.

Horizontal seat adjustment (seat stand-off)

- Pull the horizontal seat adjustment lever (5) up and move the seat to the desired position by moving it forward or back, then release the lever.



STOP

Check that the seat is locked in place.

Seat height adjustment (knee height and operator’s weight)

To adjust the height and spring (operator’s weight) of the air suspension seat, use the switch (4). This switch works for both the adjustments.

The seat height is adjustable step-less.

Take the following procedure to achieve a comfortable cushioning effect.

Raising the seat for a heavier operator:

- Turn on the key and pull up the switch (4).

While holding down the switch (4), the seat keeps moving up to its highest position.

Lowering the seat for a lighter operator:

- Pull down the switch (4).

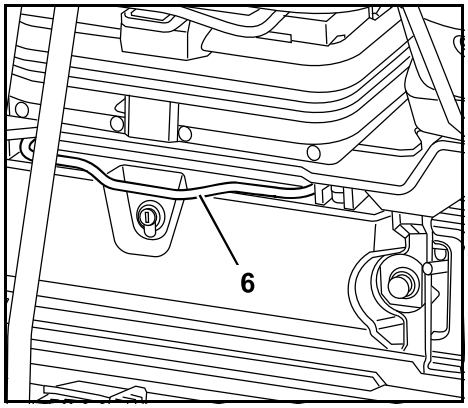
While holding down the switch (4), the seat keeps moving down to its lowest position.

The seat can be moved down even if the key is off.

Do not hold up the switch (4) longer than 30 seconds. The air suspension may get damaged. The operator is supposed to weigh less than 150 kg.

Adjusting the console

- Pull up the console adjust lever (6) vertically and move it back and forth to adjust the horizontal position of the console. Then release the lever.



With the console in a desired position, make sure the adjust lever is locked.

Do not step on the console adjust lever nor force it to move up.
Otherwise the console adjust lever may get deformed, causing a trouble.

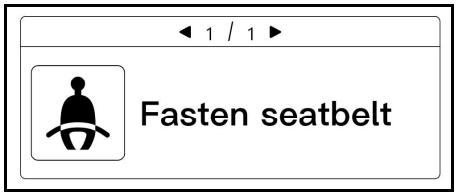
Backrest adjustment

- Take the load off the backrest and pull up the backrest adjustment lever (figure below, position/2). Set the backrest to the desired sitting position and release the lever.

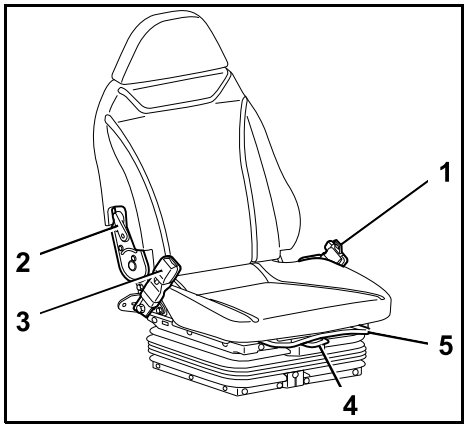
The backrest should be adjusted so that the operator can safely operate the control levers with the back resting completely on the backrest.

Seat belt

Risk of accidents!
Operating the machine without wearing the seat belt is prohibited!
The belt buckle is equipped with a sensor. This sensor detects whether the seat belt is fastened and whether the tongue is inserted and latched in the buckle.
If the engine starts and the seat belt is not latched inside the buckle, a warning message appears on the display.
- *Only operate the machine with the seat belt fastened.*



- Pull the seat belt (1) out of the belt retractor, wrap it around your waist and latch it in the buckle (3).
- Make sure that the seat belt fits tightly and the buckle is snapped into place.
- To release the seat belt, press the red button on the buckle and slowly guide the belt back into the belt retractor.

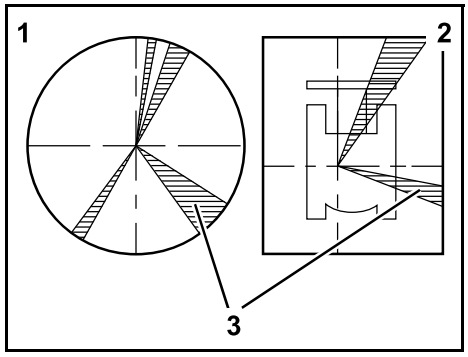


Make sure not to twist the seat belt when rolling it up.
If the belt is twisted when you roll it up, the belt lock in the belt retractor may not work properly.

Field of view

When the operator is sitting in the driver's seat, it is important to be familiar with and understand the visibility conditions when operating the machine. Within the machine's immediate radius of action, this helps to detect hazards that may cause accidents early on and thus prevent them.

The illustration shows the field of view and the areas that are not visible. The field of view varies from operator to operator and depending on the position of the seat.



1. Field of view within a radius of 12 m
2. Field of view in the immediate area
3. Indirect field of view (visible using mirrors)

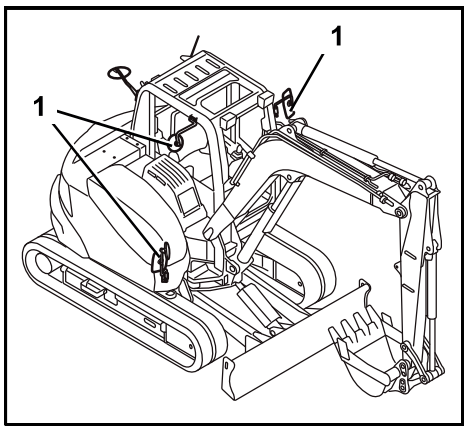
- Take a seat in the operator's seat and adjust the seat (page 89).
- Check indirect field of view (3) shown in the illustration from the seated position.
- In order to familiarise yourself with the obscured areas, check the field of view (1 and 2) for a clear line of sight.
- In order to see the indirect field of view (3), adjust the rear view mirrors (page 92).

The field of view in the previous figure was determined using a field of view test method based on the performance criteria from ISO 5006:2017.
If structural modifications to the machine restrict the defined visibility conditions, then the machine operator must carry out a new risk assessment for the changed visibility conditions. The operator can use the "Field of view" section in these operating instructions as a reference for the new risk assessment.

Adjusting the rear view mirrors

Risk of accidents!
Adjust the rear view mirrors while the machine is standing still and the engine is switched off.

- Check whether the area behind the machine is obscured from view.
- Check the adjustment of the rear view mirrors (1).
- If necessary, adjust the rear view mirrors in order to ensure a clear view of the rear and of the obscured areas.



Cleaning and maintaining the rear view mirrors

- If the rear view mirrors are dirty or steamed up, wash and wipe them dry.
- Replace lost, damaged, tarnished or warped rear view mirrors immediately with new rear view mirrors.
- If the rear view mirrors can no longer be adjusted, repair the adjustment mechanism, or replace the rear view mirrors if necessary.

Safety instructions for starting the engine

The machine is equipped with an anti-theft system (page 153).

When starting the machine for the first time on a work day, carry out the pre-operational services (page 83).

Make sure that there are no persons within the machine's working area. It is essential to warn persons in the vicinity of the machine by briefly honking the horn.

Make sure that all operational controls are in the neutral position.

Starting the machine is only allowed when the operator is sitting on the operator's seat.

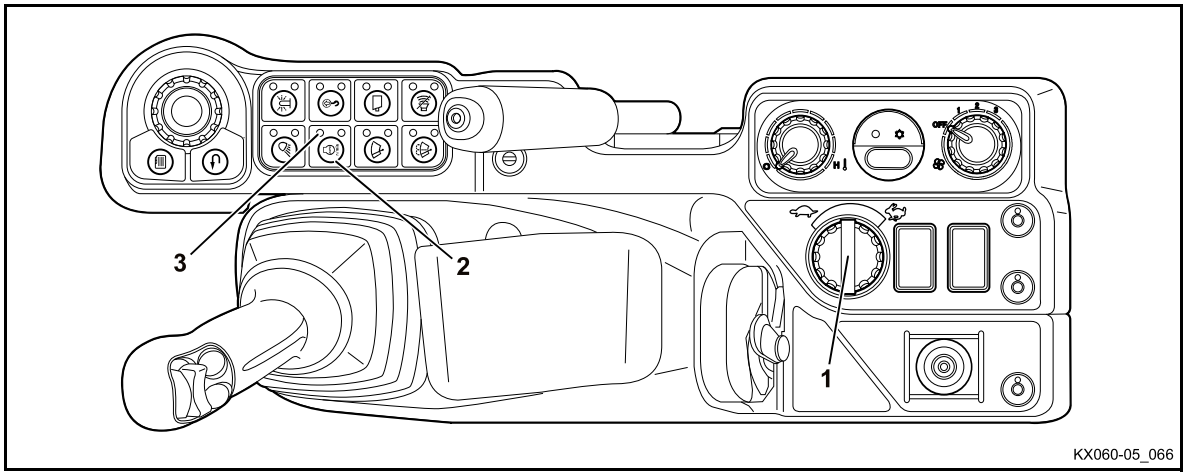
Before starting the engine, each operator must set up the workspace to suit their needs, see “Setting up the workplace” (page 88).

If the engine does not start immediately, cease the starting procedure. Wait a short time before reattempting a start. If the engine does not start after several attempts, contact skilled personnel. If the battery is discharged, jump-start the machine (page 142).

Do not use Start pilot or similar substances as a starting aid.

Starting the engine

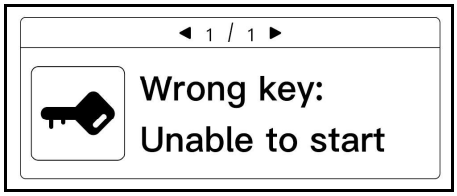
- Place the potentiometer (1) to the centre position between  and  . The AUTO IDLE switch (2) is switched off. The indicator (3) does not light up.



- Insert the key into the starter switch and turn it to the RUN position.

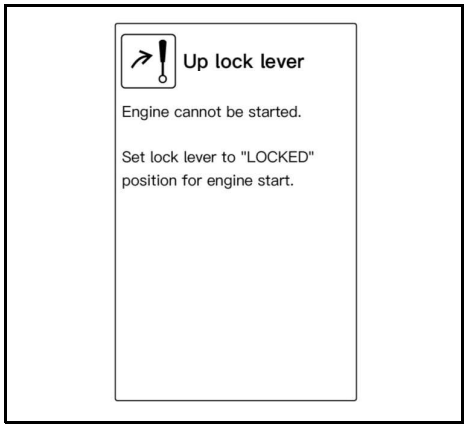
Before starting the engine, make sure that the dozer control lever is not at the floating position (page 125).

The machine is equipped with an anti-theft system. If someone tries to start the machine with the wrong key, the display message as in the figure on the right appears.

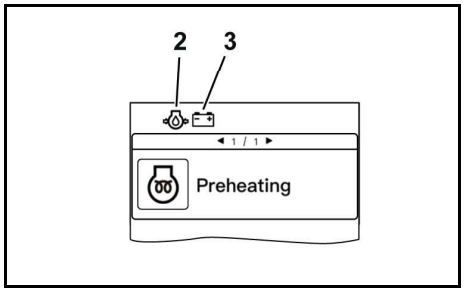


If the bunch of keys contains metal parts, such as key rings or other keys, the engine might fail to start.

If the control lever lock is not raised, the display message as in the figure on the right appears.



The display message as in the figure on the right appears for a short period of time. The engine can be started after it disappears.

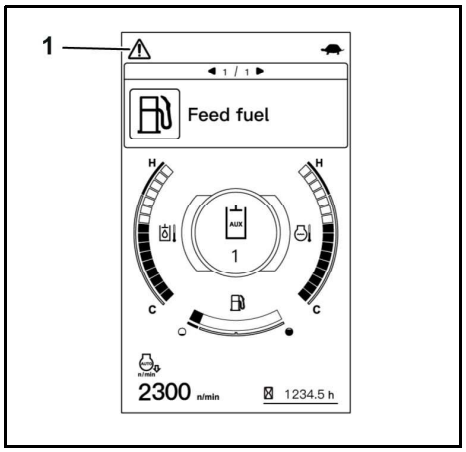


The engine oil pressure indicator (2) lights up, then goes out again after the engine has started.

The charge indicator (3) lights up, then goes out again after the engine has started.

If the indicators do not light up when the starter switch is in the RUN position, remove the key and contact suitably qualified personnel.

If the message "Feed Fuel" appears in the display and the warning light (1) flashes yellow, there is very little fuel left in the tank. Refuel the machine (page 144).



- Turn the starter switch to the START position and hold it there until the engine has started. Release the starter switch.
- If the engine does not start within 10 seconds, turn the starter switch to STOP, then wait for 20 seconds and repeat the start procedure.

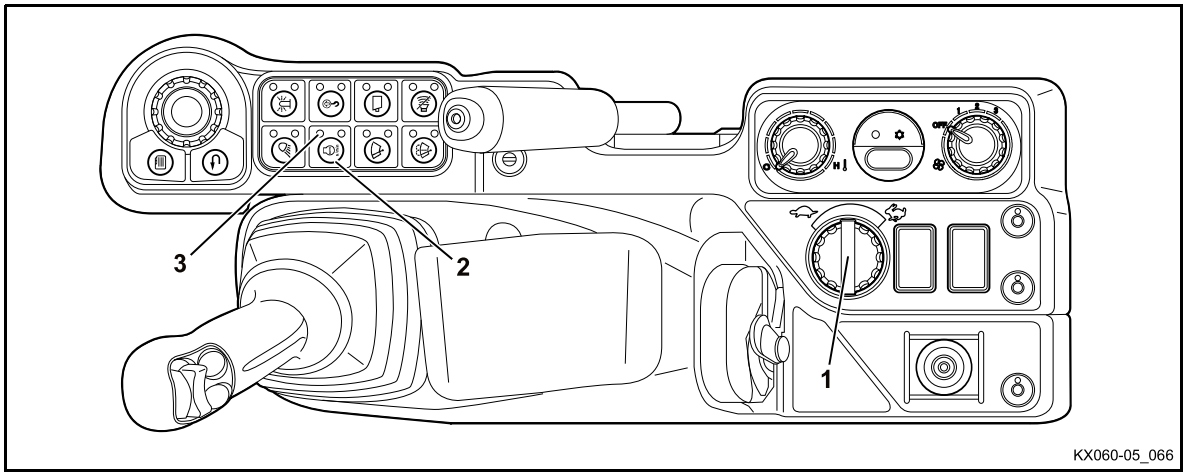
When the engine starts, the display indicators may turn off briefly and an audible signal may sound. This does not constitute a malfunction on the machine.

- Lower the left control console and make sure that the control lever lock engages.
- Let the engine run at middle speed until the operating temperature has been reached.

After the engine has reached its operating temperature, set the engine speed required for operation:

- Turn the potentiometer (1) towards or until the required speed is reached.
- Turn on AUTO IDLE control (2).

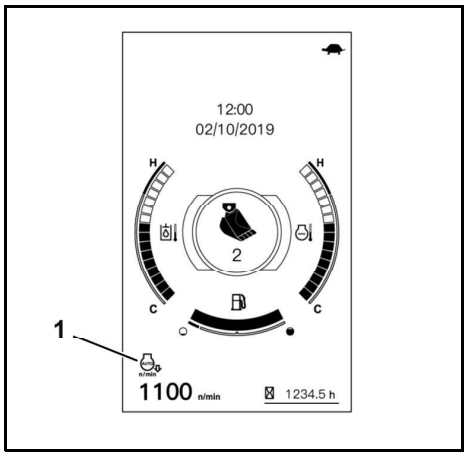
The indicator (3) lights up when the AUTO IDLE control is enabled. The AUTO IDLE control makes sure that the pre-selected engine speed drops down to idle speed after approx. 4 seconds - provided that no control lever is being used.



When the hydraulic oil is cold (i. e. in cold-weather conditions), the AUTO IDLE control may experience problems during the warm-up phase. This does not constitute a malfunction on the machine.

When AUTO IDLE control turn on, the AUTO IDLE indicator (1) comes up.

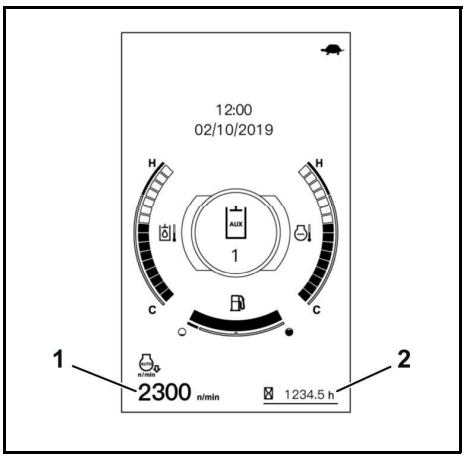
When engine speed drops down to idle speed by AUTO IDLE control, the auto idle indicator (1) flash.



Numeric (1) displays of the engine speed show the engines current number of revolutions per minute.

The time meter (2) shows the actual hours of operation of the machine (independent from the engine speed).

Keep an eye on the displays and indicators during operation (page 98).



Starting the Engine in Cold-Weather Conditions

- Turn the potentiometer to the position.
- The AUTO IDLE switch is switched off.
- Insert the key into the starter switch and turn it to the RUN position.
- The preglowing indicator lights up for a short period of time. The engine can be started after it goes off.
- Turn the starter switch to the START position and hold it there until the engine has started. Release the starter switch.

If the engine does not start, turn the starter switch to STOP and then repeat the start procedure.

When the engine starts, reduce the engine speed until the engine has warmed up and the operating temperature has been reached.

Stopping the engine

Make sure the engine speed is set to idle before stopping the engine. When stopping the engine at a higher speed, the turbo charger can be damaged due to an insufficient lubrication.

If the engine is to be stopped to take the machine out of operation, the services for placing the machine out of operation (page 131) must be carried out.

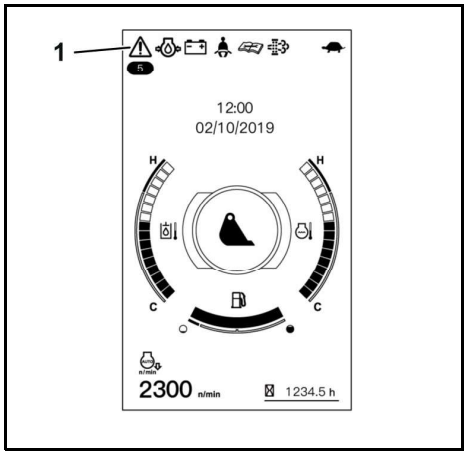
- Turn the starter switch to the STOP position and remove the key.

Observation of the displays after starting and during operation

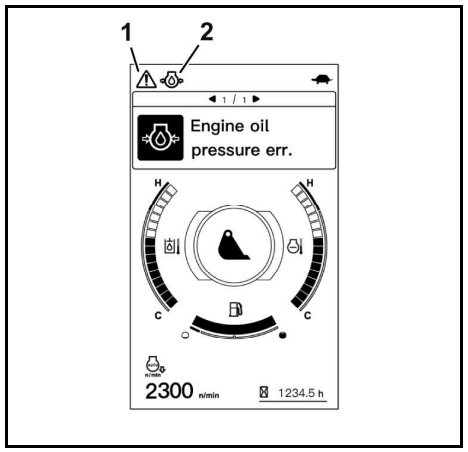
The operator must observe the display indicators and displays after starting and during operation.

The warning light (1) flashes red when a system fault or technical malfunction occurs. Stop the engine immediately! The warning light flashes yellow when the system issues a warning. In addition to the messages that appear in the display, you will also hear an acoustic warning signal.

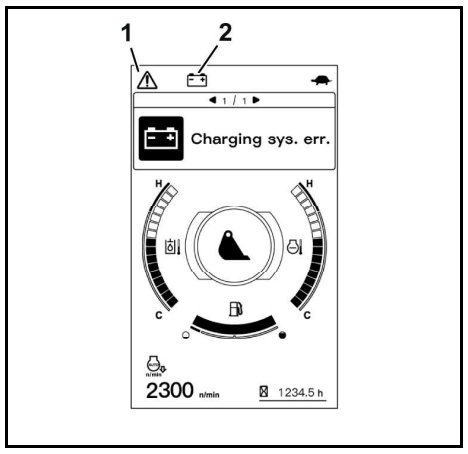
Clear the messages by taking appropriate steps, see "Troubleshooting: Display indications" (page 160), or contact qualified personnel if necessary.



If the engine oil pressure becomes too low during operation, the engine must be stopped immediately. The engine oil pressure indicator (2) lights up, the warning light (1) flashes red and the display message as in the figure on the right appears.

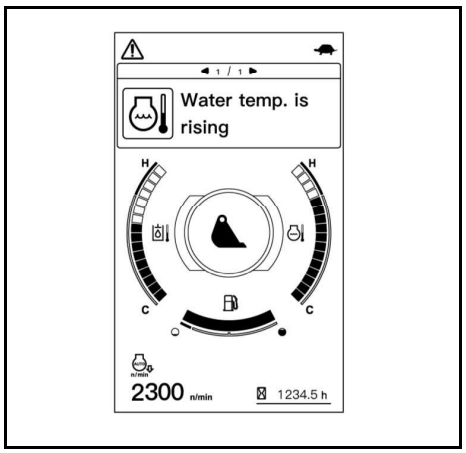


If a fault occurs in the charging system during operation, the engine must be stopped immediately. The charge indicator (2) lights up, the warning light (1) flashes red and the display message as in the figure on the right appears.

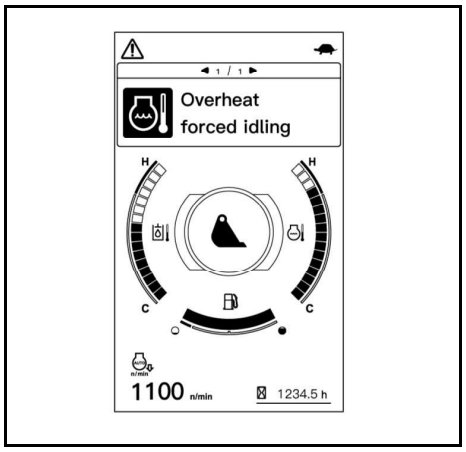


When the machine is being operated at or close to full capacity, the temperature of the coolant can rise a little higher than normal. The display message as in the figure on the right appears.

Operate the machine only with reduced loads until the operating temperature is normal again.



If the coolant temperature is too high, cool down the engine by changing into idle. The display message as in the figure on the right appears.



Allow the machine to idle for five minutes before switching off the engine!

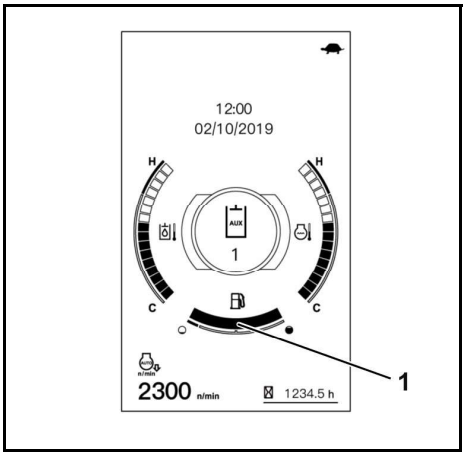
- Check the level of the coolant in the expansion tank.

STOP *Do not open the radiator cap → risk of scalding.*

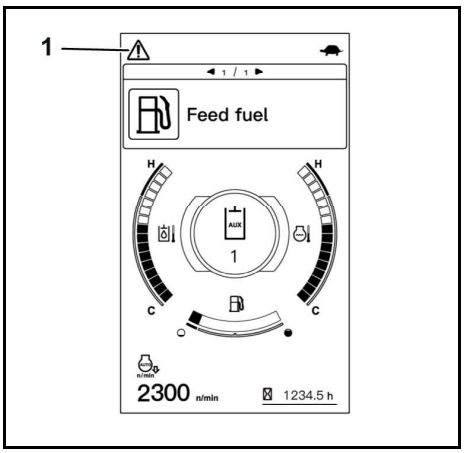
- If the water level is below the "LOW" mark, let the engine cool completely and add coolant (page 175).
- Check the cooling system for leaks; if necessary, contact skilled personnel.
- Check if the V-belt is very loose or broken; if necessary, contact skilled personnel.
- Check if the air intake in the right side panel, the radiator, and the condenser are very dirty. If necessary, clean the radiator (page 176).
- Watch the fuel gauge (1).

The bar indicates the amount of fuel remaining in the tank. The bar slowly becomes shorter as fuel is used up during operation.

When the fuel tank is empty, the machine cannot be operated. The machine must be refuelled and the fuel system bled.



If the message "Feed Fuel" appears in the display and the warning light (1) flashes yellow, there is very little fuel left in the tank. Refuel the machine (page 144).

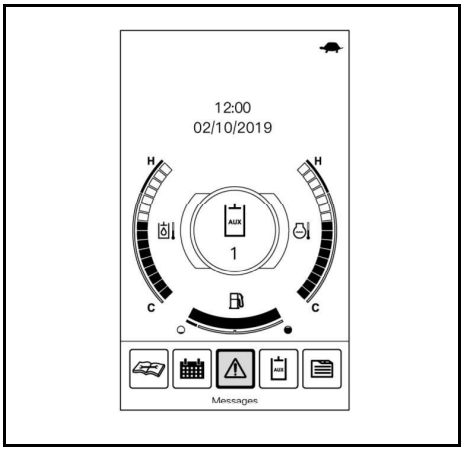


Checking error messages

- Press menu switch on dial switch.

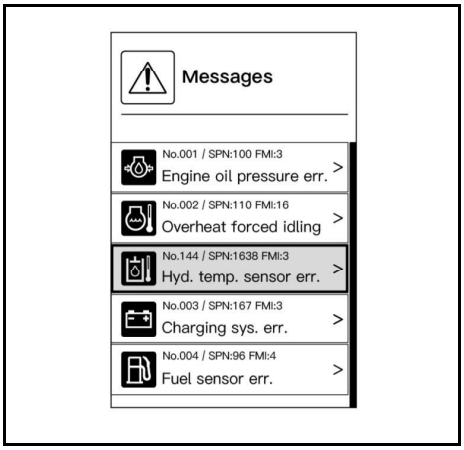
The menu bar appears in the display. (“Messages” is selected.)

- Press Jog dial (enter switch).



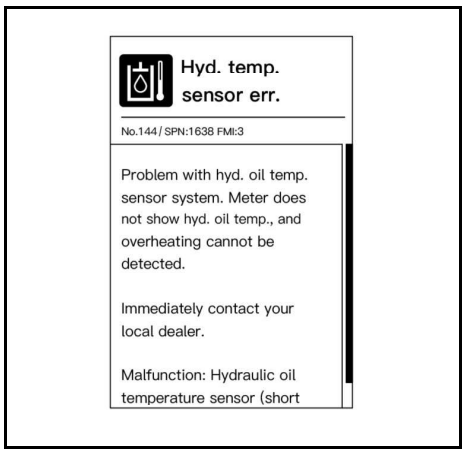
The list of messages appears in the display.

- Rotate jog dial to the right or the left until the desired item is selected.
- Press Jog dial (enter switch).



The detail of the message appears in the display.

- To rotate jog dial can be used to scroll up and down through this screen.



Also stop the engine immediately if

- the engine speed rises or drops suddenly,
- abnormal noises are heard,
- the mechanical equipment do not respond to the control lever as expected or
- the exhaust fumes are black or white. When the engine is still cold, white smoke for a short time is normal.

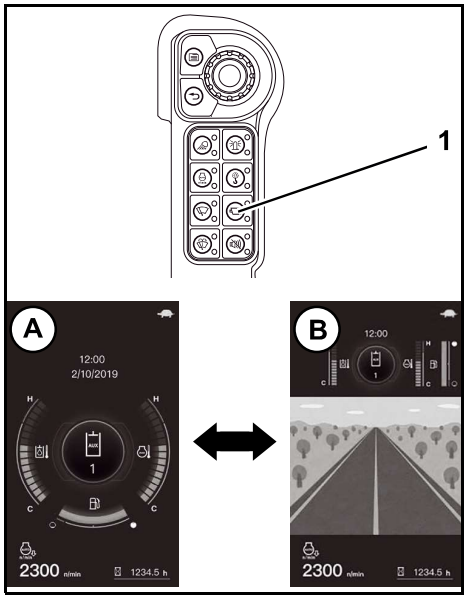
Operating the rear view camera

The rear view camera is an assistance system and is only to be used to improve and monitor the view in the immediate vicinity of the rear of the construction machine during turning and operating movements.

Any other use is considered to be a non-intended use. The operator bears sole responsibility for losses or risks arising from such use.

- Press the camera switch (1).

The standard view (A) and the rear view camera view (B) are switched. If the rear view camera has been switched on, the indicator lights up.



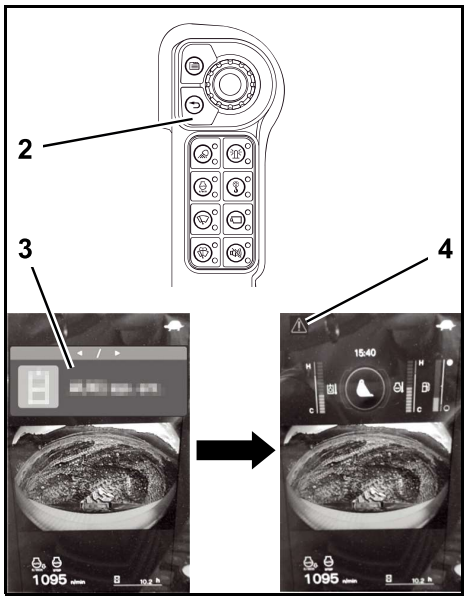
The rear view camera should not be used as a parking and manoeuvring aid as it may not cover the requisite working area in full.
When parking and manoeuvring, you must not rely on the rear view camera alone. Observe the entire surroundings and comply with the respective safety regulations.

The image on the monitor of the rear view camera may show a distorted image of the area behind the construction machine. The space available behind the construction machine may appear larger than it actually is.
This is due to the wide-angle capability of the system, which is designed to capture as large an area behind the construction machine as possible, in order to show the operator every obstacle.

If an error occurs while operating the camera, a message (3) will appear on the display as shown in figure on the right.

The message (3) can be closed with the return switch (2) in order to make the status indicator visible again. In that case, an exclamation mark will appear in the status indicator (4).

Closing the message (3) will not delete or resolve the error! The error will remain active and will be marked by the exclamation mark (4)!
To prevent personal injury and material damage, all error messages must be checked and should not be ignored.
In the event of ambiguities, work must be discontinued until the error has been located and rectified.



Diesel particle filter regeneration

The machine has an exhaust system that is equipped with a diesel particle filter, which filters out carcinogenic soot particles from the exhaust gases.

The diesel particle filter must be regenerated regularly in order to prevent the soot particles from clogging the diesel particle filter rendering it useless. To do so, the exhaust temperature is increased automatically to incinerate the soot in the diesel particle filter.

The diesel particle filter is regenerated automatically. It can also be manually started or blocked.

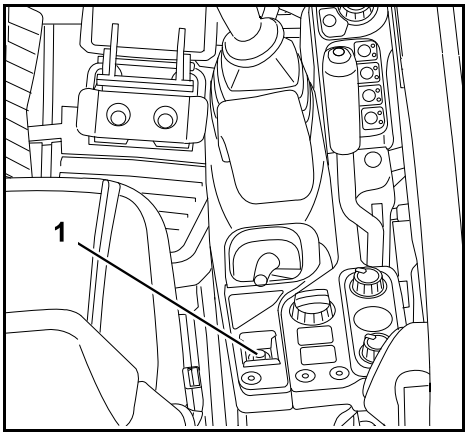
General notes

Health hazard!
Soot particles from the exhaust gases are carcinogenic.
The regeneration should be done outdoors only.
Despite using a diesel particle filter, there is still a risk of poisoning by inhaling the exhaust gases!
- *Observe the safety regulations of TRGS 554 and any national regulations.*

Risk of fire and injury!
During regeneration, the exhaust gas temperatures increase significantly, and the gases leaving the exhaust system are hotter than during normal operation.
There is a risk of fire and injury when people, animals, plants or flammable materials are close to the exhaust system!
- *The exhaust system and the space around the exhaust system should be kept free of flammable materials.*
- *Stop the diesel particle filter regeneration if there are any risks to the environment.*
- *Do not leave the machine unattended during diesel particle filter regeneration.*
- *The diesel particle filter should only be regenerated outdoors.*

The diesel particle filter regeneration may be locked and released any time using the inhibit switch (1).
The particle filter regeneration lock will be displayed by the indicator in the switch and a related message on the display.

Risk of damage to the diesel particle filter!
The diesel particle filter can be damaged irreparably by the carbon particles if incorrect engine oil or incorrect diesel fuel is used.
- *Only use engine oils with the specification "API CJ-4" or "API CK-4".*
- *Only use low-sulphur diesel fuels.*
- *Adhere to the list of operating materials.*

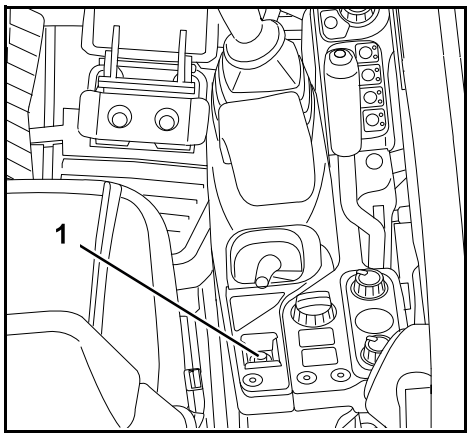


High engine speeds result in a higher temperature of the exhaust gas. This burns the particulate in the diesel particle filter. This reduces the number of regeneration cycles required when compared to lesser load on the engine. The exhaust gas temperature is not high enough to burn the soot particles in the diesel particle filter in idling and part-load conditions. As a consequence, the number of regeneration cycles increases. Hence, it is advisable not to operate the engine in idle condition frequently.

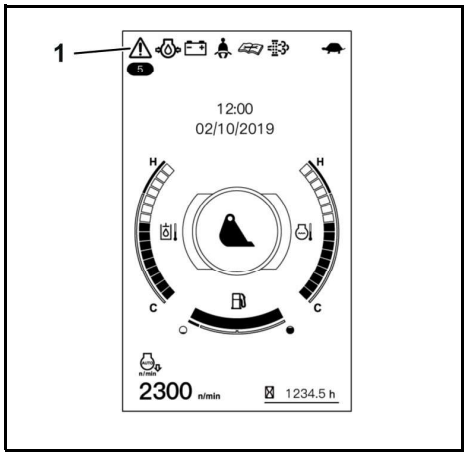
Automatic diesel particle filter regeneration - Procedure

The following conditions have to be met for carrying out automatic regeneration.

1. The automatic diesel particle filter regeneration is released and the indicator in the inhibit switch (1) does not start glowing.
2. The engine coolant should be at operating temperature.
3. The engine speed should be the speed such the “Raise engine speed” indicator and message disappear.

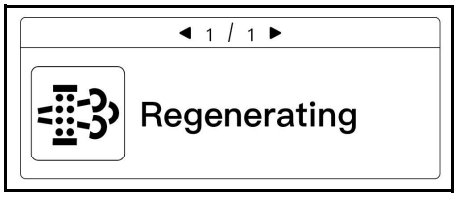


Various messages are shown in the display during the regeneration process. In addition, the yellow or red warning light (1) flashes depending on the relevance of the message.



When the automatic diesel particle filter regeneration starts, a message appears in the display as shown in the figure on the right. In addition, the yellow warning light flashes and an audible signal is emitted every 60 seconds.

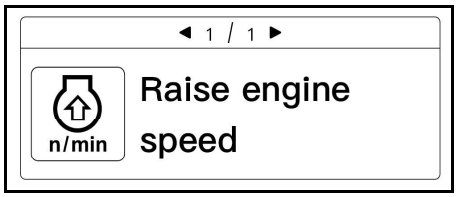
The exhaust temperature will increase significantly during diesel particle filter regeneration. However, the machine can continue to be operated.



- Make sure that no people, animals, plants and/or flammable materials are within the immediate working area!

If the engine speed is too low, the message in the display changes every 3 seconds, as shown in the figure on the right. In addition, the yellow warning light flashes and an audible signal is emitted every 60 seconds.

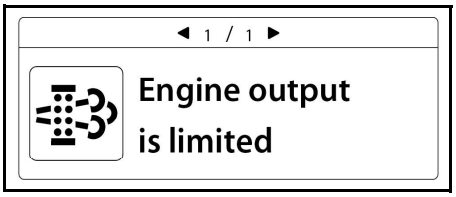
- Raise the engine speed until the “Raise engine speed” indicator and message disappear.



The diesel particle filter is regenerated.

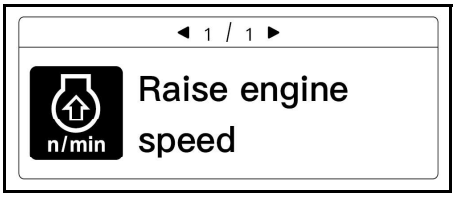
If the diesel particle filter is regenerated frequently and incompletely, the degree of saturation increases in the diesel particle filter. The engine power is reduced to 50% to prevent damage to the diesel particle filter.

If the degree of saturation increases, the message in the display changes every 3 seconds, as shown in the figure on the right. In addition, the red warning light flashes and an audible signal is emitted every 60 seconds.



The diesel particle filter is regenerated. But the engine power is restricted to 50%.

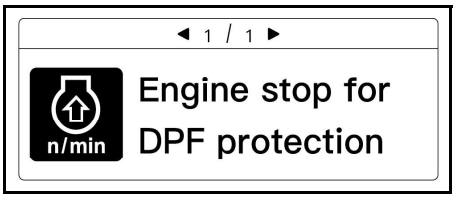
If the engine speed is too low, the message in the display changes every 3 seconds, as shown in the figure on the right. In addition, the red warning light flashes and an audible signal is emitted at brief intervals.



- Raise the engine speed until the “Raise engine speed” indicator and message disappear.

The diesel particle filter is regenerated. But the engine power is restricted to 50%.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted at intervals.



The engine switches off automatically. Restarting and raise the engine speed until the “Raise engine speed” indicator and message disappear.

- Turn the starter switch to the STOP position.
- Start engine.
- Raise the engine speed until the “Raise engine speed” indicator and message disappear.

The diesel particle filter is regenerated. But the engine power is restricted to 50%.

If the degree of saturation is very high, the diesel particle filter has to be reconditioned by your KUBOTA dealer.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted at intervals.

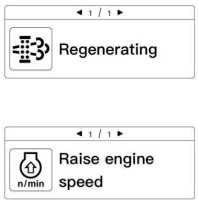
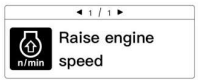
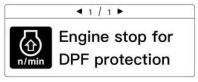
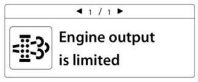
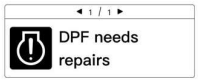
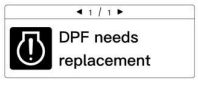
- Inform your KUBOTA dealer immediately.

If the diesel particle filter is clogged and damaged, then the particle filter needs to be replaced by the KUBOTA dealer.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted continuously.

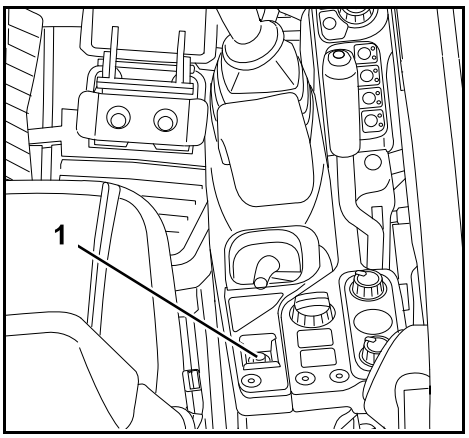
- Inform your KUBOTA dealer immediately

Automatic diesel particle filter regeneration - Overview

Warning light	indicator	Explanation	Measure
⚠ flashing (yellow)		Automatic regeneration process starts. If the message "Raise engine speed" is shown in the display, then the operator has to create the conditions necessary for regenerating the particle filter.	Make sure that no people, animals, plants and/or flammable materials are within the immediate working area. Raise the engine speed until the “Raise engine speed” indicator and message disappear. The automatic particle regeneration starts. All the functions and auxiliary ports 1 and 2 continue to be available during the regeneration.
⚠ flashing (red)		If the message "Raise engine speed" is shown in the display, then the operator has to create the conditions necessary for regenerating the particle filter. The particle filter is clogged if the message "Engine output is limited" is shown in the display. The engine power is reduced to protect the particle filter. When the control lever lock is lifted, the engine switches off after 60 seconds to protect the particle filter.	Make sure that no people, animals, plants and/or flammable materials are within the immediate working area. Raise the engine speed until the “Raise engine speed” indicator and message disappear. The automatic particle regeneration starts. All the functions and auxiliary ports 1 and 2 continue to be available.
⚠ flashing (red)		When the control lever lock is lifted, the engine switches off after 60 seconds to protect the particle filter. If the control lever lock is lowered, the engine speed is limited.	Raise the engine speed until the “Raise engine speed” indicator and message disappear. Inform your KUBOTA dealer if the regeneration does not start automatically.
⚠ flashing (yellow)		The particle filter is clogged if the message "Engine output is limited" is shown in the display. The engine power is reduced to protect the particle filter.	Keep raising engine speed and finish DPF regen. process. Make sure that no people, animals, plants and/or flammable materials are within the immediate working area.
⚠ flashing (red)		The particle filter is clogged with soot particles and the particle filter regeneration can no longer start. The particle filter must be repaired. The engine power is reduced to protect the particle filter.	Inform your KUBOTA dealer immediately.
⚠ flashing (red)		The particle filter has to be replaced. The engine power has to be limited to protect the particle filter.	Inform your KUBOTA dealer immediately.

Locking and releasing the diesel particle filter regeneration - Procedure

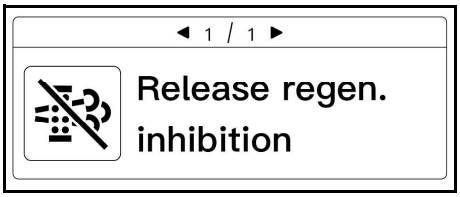
- Press the inhibit switch (1).



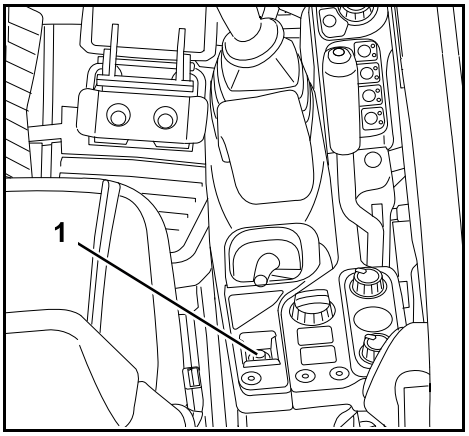
The automatic diesel particle filter regeneration is locked and the indicator in the switch lights up.

The diesel particle filter regeneration must be performed in certain intervals. If the automatic diesel particle filter regeneration has been locked and the diesel particle filter is fully saturated with soot, the operator is prompted to enable the diesel particle filter regeneration.

The display message as in the figure on the right appears. In addition, the yellow warning light flashes and an audible signal is emitted at brief intervals.



- Press the inhibit switch (1).

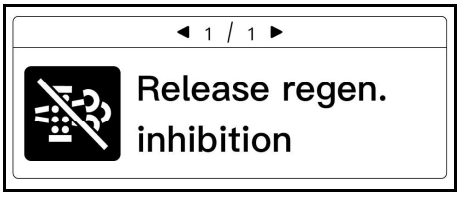


The indicator in the switch goes out and regeneration starts.

If the diesel particle filter regeneration is not released using the switch, the degree of saturation in the diesel particle filter continues to increase.

The engine power of the machine is reduced to prevent damage to the diesel particle filter.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted at intervals.



- Press the inhibit switch (1).
- Raise engine speed.
- Continue the operation.

The indicator in the switch stops glowing. The diesel particle filter is regenerated. But the engine power is restricted to 50%.

- Make sure that the regeneration process is shown on the display and that it proceeds until the display message disappears.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted at intervals.

The engine switches off automatically. Restarting and raise the engine speed until the “Raise engine speed” indicator and message disappear.

- Turn the starter switch to the STOP position.
- Start engine.
- Raise the engine speed until the “Raise engine speed” indicator and message disappear.

The diesel particle filter is regenerated. But the engine power is restricted to 50%.

If the diesel particle filter regeneration was locked permanently, the diesel particle filter must be reconditioned by your KUBOTA dealer.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted at intervals.

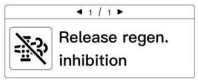
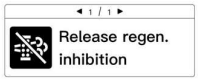
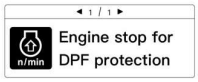
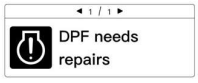
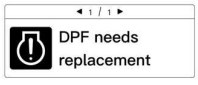
- Inform your KUBOTA dealer immediately.

If the diesel particle filter is clogged and damaged, then the diesel particle filter needs to be replaced by the KUBOTA dealer.

The display message as in the figure on the right appears. In addition, the red warning light flashes and an audible signal is emitted continuously.

Inform your KUBOTA dealer immediately.

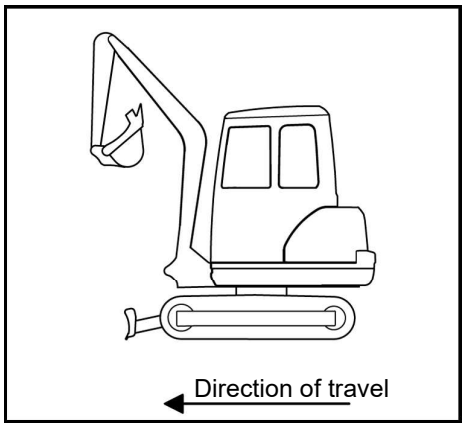
Locking and releasing the diesel particle filter regeneration - Overview

Inhibit indicator	Warning light	indicator	Explanation	Measure
lights up (yellow)	does not glow	-	Automatic regeneration process blocked. The state is before a required regeneration. If the lock switch starts flashing, then regeneration is required.	All the functions and auxiliary ports 1 and 2 continue to be available.
flashing (yellow)	flashing (yellow)		Automatic regeneration process blocked. The operator has to make the necessary preparations for regenerating the diesel particle filter.	Make sure that no people, animals, plants and/or flammable materials are within the immediate working area. Release the diesel particle filter regeneration using the inhibit switch. Raise the engine speed until the “Raise engine speed” indicator and message disappear. The automatic diesel particle regeneration starts. All the functions and auxiliary ports 1 and 2 continue to be available.
flashing (yellow)	flashing (red)	 	Automatic regeneration process blocked. The operator has to make the necessary preparations for regenerating the diesel particle filter. The diesel particle filter is clogged if the message "Engine output is limited" is shown in the display. The engine power is reduced to protect the particle filter. When the control lever lock is lifted, the engine switches off after 60 seconds to protect the diesel particle filter. If the control lever lock is lowered, then the engine is not switched off.	Make sure that no people, animals, plants and/or flammable materials are within the immediate working area. Release the diesel particle filter regeneration using the inhibit switch. Raise the engine speed until the “Raise engine speed” indicator and message disappear. The automatic diesel particle regeneration starts. All the functions and auxiliary ports 1 and 2 continue to be available.
flashing (yellow)	flashing (red)		The diesel particle filter is clogged with soot particles and the diesel particle filter regeneration can no longer start. The diesel particle filter must be repaired. The engine power is reduced to protect the diesel particle filter.	Inform your KUBOTA dealer immediately.
flashing (yellow)	flashing (red)		The diesel particle filter has to be replaced. The engine power has to be limited to protect the diesel particle filter.	Inform your KUBOTA dealer immediately.

Driving the machine

- Adhere to the general safety rules (page 17) and the safety rules for operation (page 73).
- Carry out the pre-operational services (page 83).
- Start the engine (page 94).
- Observe the displays and indicators (page 98).

Ensure that the boom and the dozer are in the direction of travel as shown in the figure.

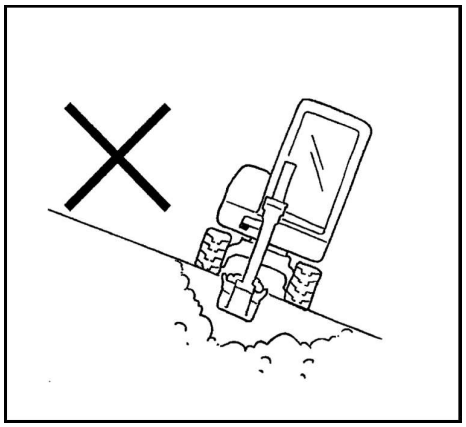


When driving with the machine, always observe the following safety instructions.

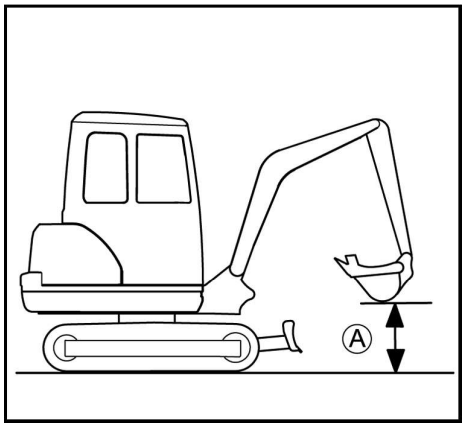
When working on slopes, observe the tilt of the machine.

Max. lateral sway → 27% resp. 15°

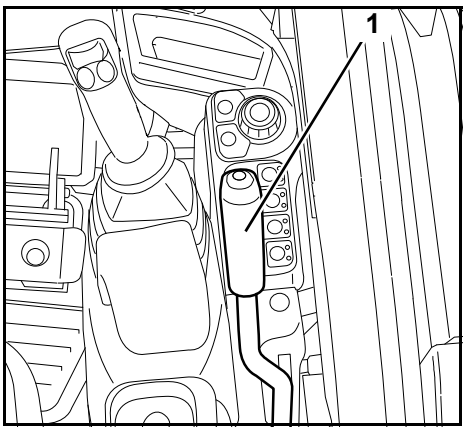
Climbing performance → 36% resp. 20°



- Keep the bucket as low as possible when driving.
- Check the ground for stability, and verify whether there are holes or other potential obstacles.
- Approach overhangs and edges of ditches carefully as they could cave in.
- Drive slowly downhill, do not allow the vehicle speed to increase uncontrollably.
- Close the cab door.
- When driving, the bucket should be approx. 200 to 400 mm (A) above the ground (see figure).



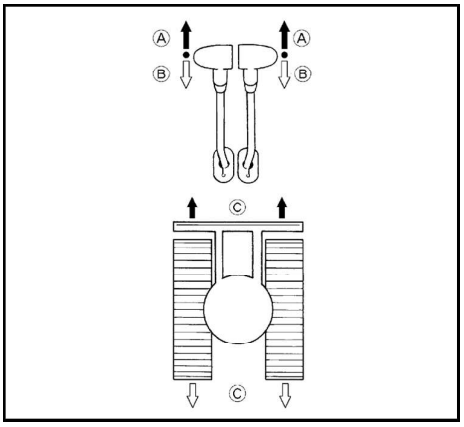
- Raise the dozer to the top position by pulling back the dozer lever (1).
- Select an appropriate engine speed.



Driving

- Push both drive levers forward simultaneously to drive the machine straight ahead. Releasing the drive levers stops the machine immediately.
  To reverse the machine, pull both drive levers back simultaneously.

(A) Forward
(B) Reverse
(C) Straight ahead

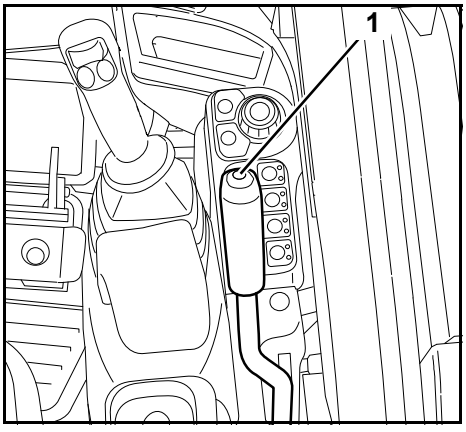


If the dozer is not in the front, as shown in the figure, but in the rear, the operation of the drive levers is exactly opposite. Drive lever forwards:

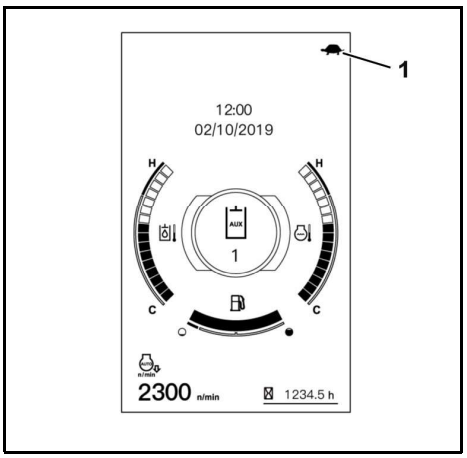
→ *The machine backs up.*

- To drive faster, press the travel speed button (1).

If the driving resistance increases when driving with travel speed (due to a slope or obstacle), the machine automatically switches to low speed. If the driving resistance decreases after a while, the machine switches automatically back to travel speed.



Two audible signals will sound and the indicator (1) will change to the icon of fast speed. Pressing the travel speed button again switches back to normal speed and only one signal will sound.



STOP

Do not drive fast on muddy or uneven terrain, also if another control is operated (e.g. turning the swivel frame).

Turning

STOP

Turns are described for the forward direction of travel with the dozer at the front. If the dozer is positioned at the rear, the steering movements should be in the opposite direction.

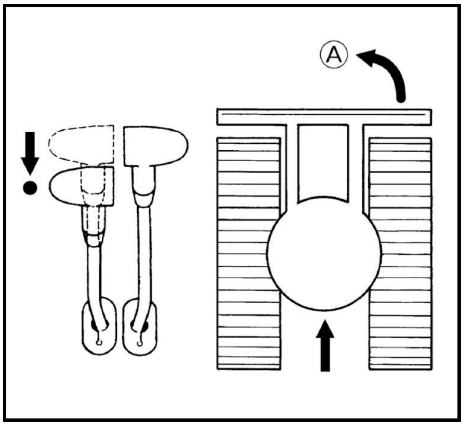
STOP

When making turns, be sure nobody is standing within the swing area of the machine.

During driving

- Pull the left drive lever to neutral, leave the right drive lever pushed forward.

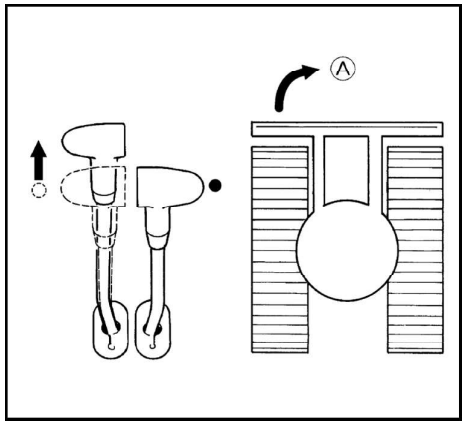
(A) The machine makes a left turn.



From a standing position

- Leave the right drive lever in neutral, push the left drive lever forward. In this case, the turning radius is determined by the right track.

(A) The machine makes a right turn.

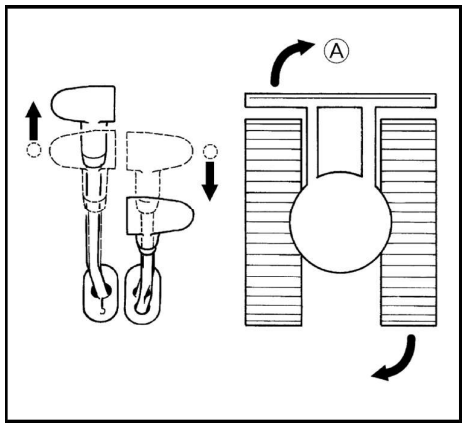


Turning on the spot

Do not make a turn on the spot with the travel speed button actuated.

- Move the drive levers in opposite directions. The tracks will turn in opposite directions. The centre of the vehicle is its vertical axis.

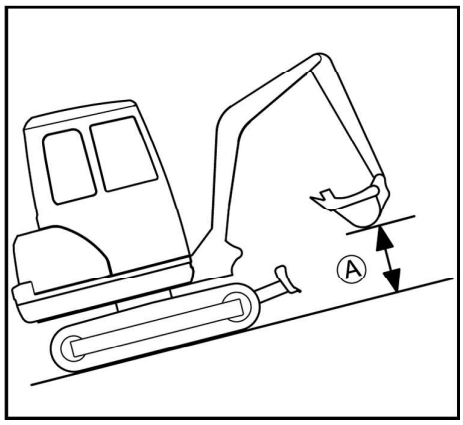
(A) Turning on the spot to the right.



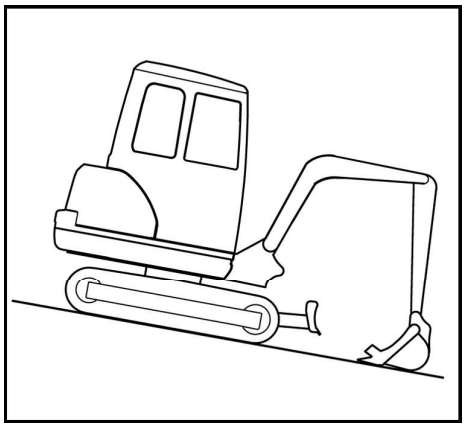
Driving uphill and downhill

Exercise extreme caution when driving up and down a slope. Do not use the travel speed button.

- When driving on gradients, raise the bucket approx. 200 to 400 mm (A) above the ground (see figure).

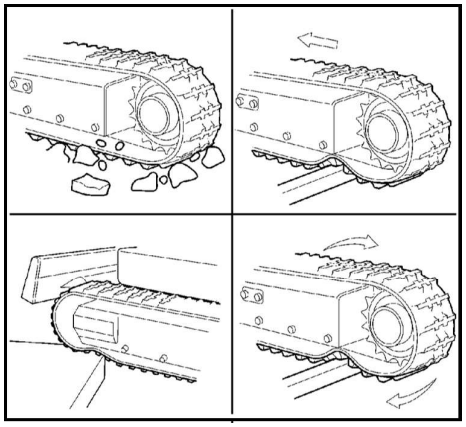


- When driving on gradients, let the bucket slide over the ground if the terrain allows it.



Notes for rubber crawler operation

- Driving or turning on sharp objects or over steps causes excessive wear on the rubber crawlers and will lead to breaking of the rubber crawler or cause the crawler running surface and the steel inserts to be cut.
- Make sure that no foreign objects get stuck in the rubber crawler. Foreign objects lead to excessive crawler wear and can cause it to break.



- Keep oil products away from the rubber crawlers.
- Remove any fuel or hydraulic oil spilled on the rubber crawlers.

Making sharp turns

- Do not make sharp turns on streets with a high-friction tarmac, e.g. concrete.

Protecting the crawler against salt

- Do not work with the machine on the seashore. (The salt will cause the steel insert to corrode.)

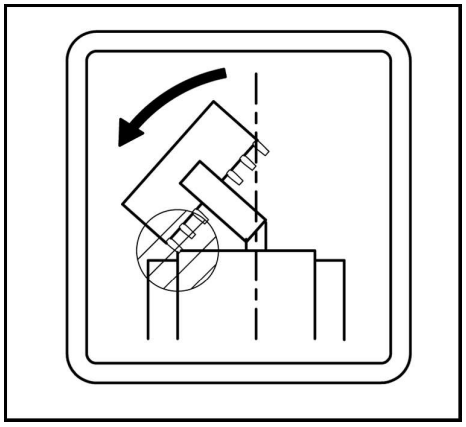
Operating the controls during excavation work

Always observe the following safety instructions when working with the machine.

- Breaking concrete or rocks with the bucket is prohibited.
- Do not use the dropping action of the bucket for excavation.
- Never fully extend the cylinders. Always keep a certain safety margin, especially when operating with a breaker (optional equipment).
- Never use the bucket as a hammer to drive posts into the ground.
- Do not drive or dig with the bucket teeth rammed into the ground.
- When loading soil, do not dig the bucket deeply into the ground. Instead, make relatively shallow slices with the bucket out as far as possible. This technique reduces the stress on the bucket.
- When working in water, the water should only reach up to the lower edge of the swivel frame.
- After using the machine in water, always grease the pins on the bucket and arm with grease until the old lubricating grease emerges.
- When digging with the boom above the dozer, make sure that the boom cylinder does not come into contact with the dozer.
- Adhering soil can be shaken off when the bucket is being emptied by moving the cylinder to the end of the stroke. Should this not suffice, dump the arm as far as possible and swing the bucket back and forth.
- To increase the machine's stability, we recommend lowering the dozer onto the ground. The dozer may only be used to increase stability if the dozer cylinder is equipped with a pipe safety valve. The dozer control lever must not be moved into floating position in the process. The machine's stability is not increased by the dozer while in the floating position.

Note on using wider and deeper buckets

When using a wider or deeper bucket, take good care when swinging or retracting the front attachments to make sure that the bucket does not hit the cab.

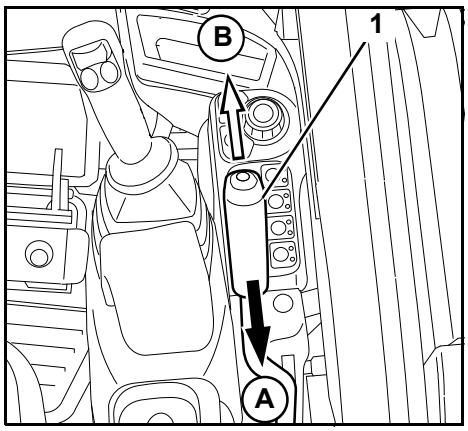


Operating the dozer

Lifting and lowering

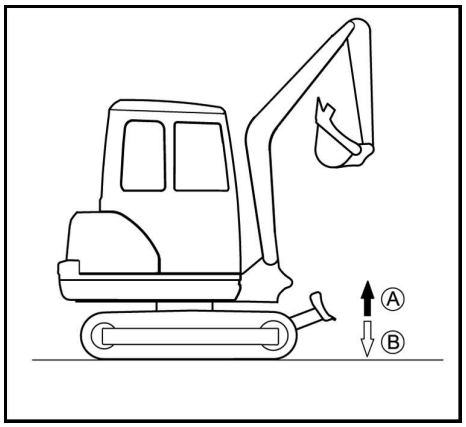
When working with the dozer, operate both drive levers with the left hand and the dozer control lever with the right hand.

- To lift the dozer, pull the dozer control lever (1) back.
- To lower the dozer, push the dozer control lever forward until you start to feel resistance.



(A) Dozer up.

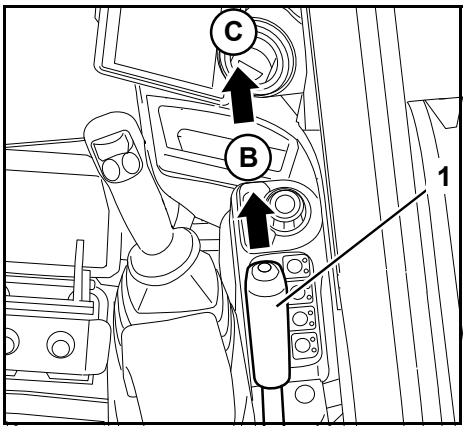
(B) Dozer down.



Floating position

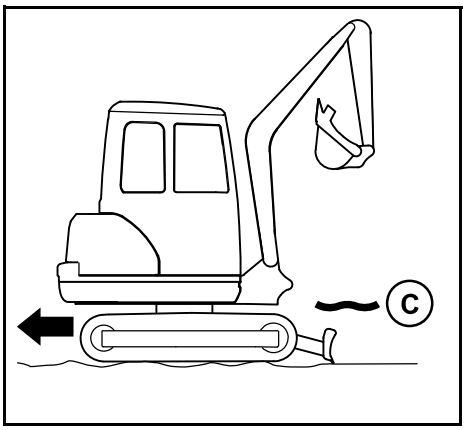
Only use the dozer's floating position on loose ground when driving in reverse. Otherwise, the dozer can dig itself into the ground uncontrollably.

The dozer control lever is used to switch on the floating position. Enabling the floating position releases pressure from the dozer cylinder. This function is used to level the surface while driving in reverse, for example, in order to follow the contour of the surface with the dozer.



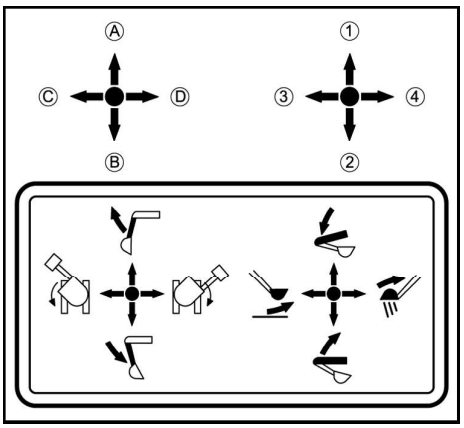
- In order to move the dozer into floating position, push the dozer control lever (1) forwards completely (C) beyond the noticeable resistance (B).

The dozer remains in the floating position until the dozer control lever is returned to the neutral position.



Overview of control lever functions (standard setting)

The figure shows, in connection with the following table, the functions of the left and right control levers.

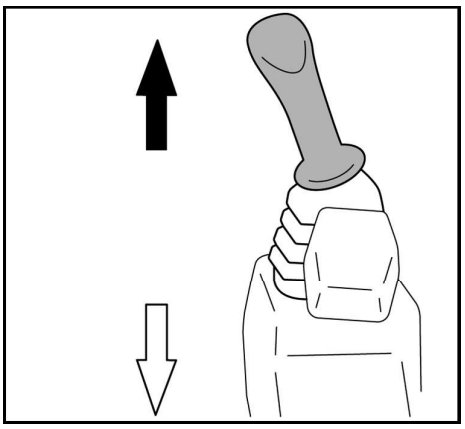


Control lever		Movement
Right control lever	1	Lower boom
	2	Raise boom
	3	Bucket crowd
	4	Bucket dump
Left control lever	A	Arm dump
	B	Arm crowd
	C	Swivel frame to the left
	D	Swivel frame to the right

Operating the boom

If the machine is overloaded, the boom must be lowered until the load rests on the ground. To prevent personal injuries and damage to equipment, do not operate any other functions (e.g. moving the swivel frame).

- To raise the boom, pull the right control lever back (figure/⇩).

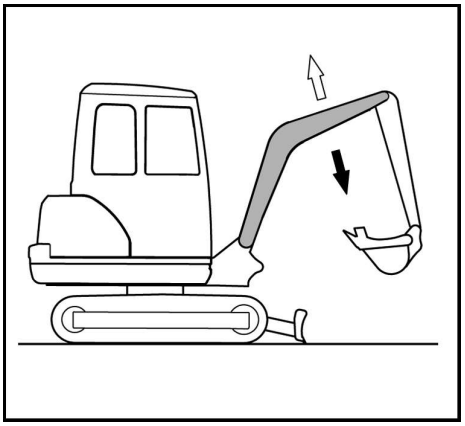


The hydraulic cylinder of the boom is equipped with a cushioning function, which prevents the excavated material in the bucket from falling out. When the hydraulic system operating temperature is low, the cushioning is delayed for approx. 3 to 5 s. This delay is due to the viscosity of the hydraulic oil and is not a malfunction.

- To lower the boom, push the right control lever forward (figure/⇧).

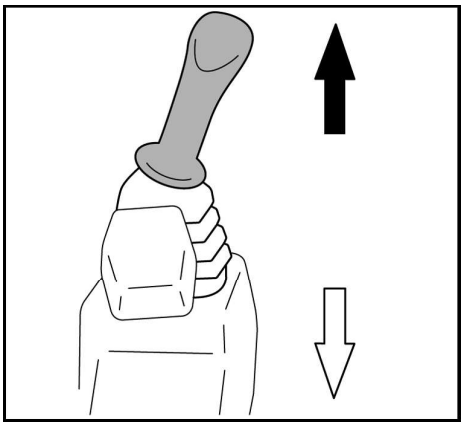
Watch the boom during lowering, so that the boom or the bucket teeth do not hit the dozer.

The boom moves as shown in the figure.

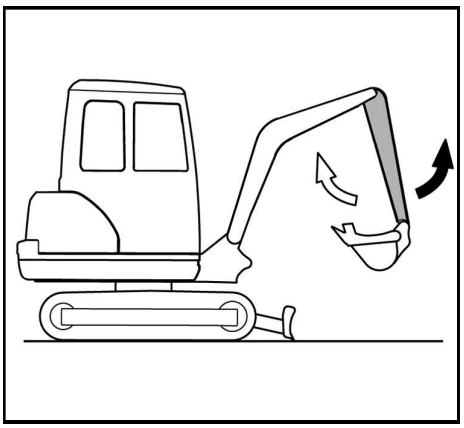


Operating the arm

- To dump the arm, push the left control lever forward (figure/⇧).
- To crowd the arm, pull the left control lever back (figure/⇩).

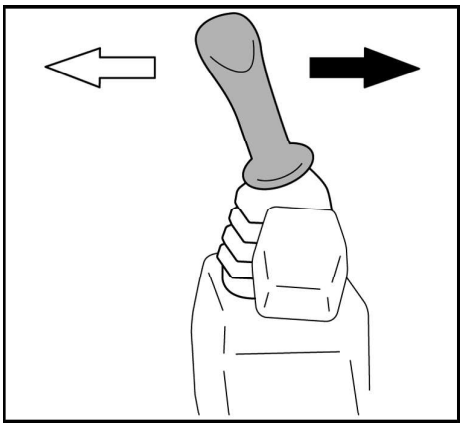


The arm moves as shown in the figure.



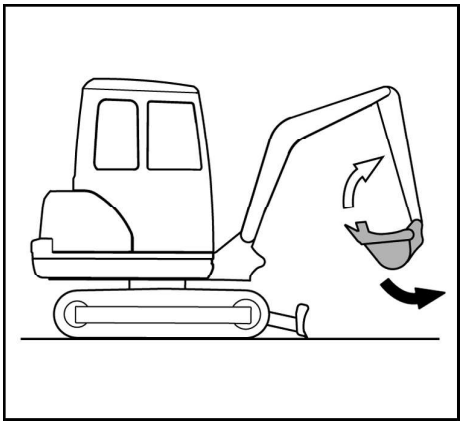
Operating the bucket

- To crowd (digging) the bucket, move the right control lever to the left (figure/⇦).
- To dump (empty) the bucket, move the right control lever to the right (figure/➔).



When crowding the bucket, take care that the teeth do not hit the dozer.

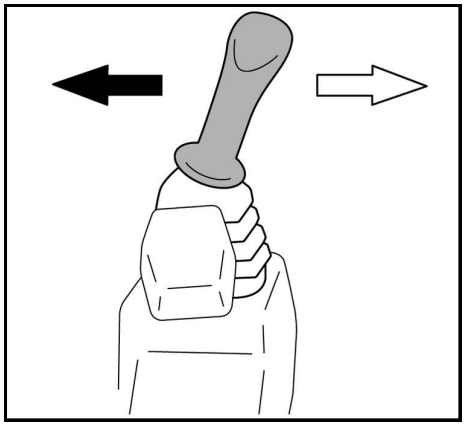
The bucket moves as shown in the figure.



Swivelling the swivel frame

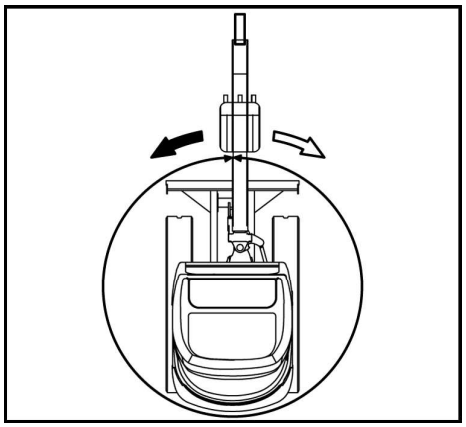
No person is allowed to stand in the swivel area during the movement.

Swivel carefully to avoid any contact of the front attachments with adjacent objects.



- To turn anticlockwise, move the left control lever to the left (figure/🡐).
- To turn clockwise, move the left control lever to the right (figure/🡒).

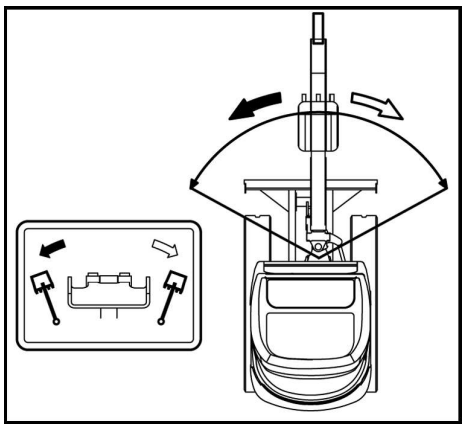
The turning operation takes place as shown in the figure.



Swinging the boom

No person is allowed to stand in the swing area during the movement.

Swing carefully to avoid any contact of the front attachments with adjacent objects.



- To swing the boom anticlockwise, press the boom swing pedal on the left-hand side (figure/🡐).
- To swing the boom clockwise, press the boom swing pedal on the right-hand side (figure/🡒).

The figure details the swing movement.

The boom swing control pedal can be secured against inadvertent operation by lowering the locking flap. Fold the locking flap when the boom swing pedal is not in use.

Operating the auxiliary ports

The auxiliary port is used for hydraulic implements, such as a breaker. You can set the flow rate prior to operating the auxiliary port. See the “Flow rate setting” section (page 125) for details.

The machine can be equipped with a single auxiliary port (AP 1) or in combination with two auxiliary ports (AP 1+2). The operation features of the right and left control levers are configured according to the equipment attached.

Only attachments approved by KUBOTA may be used. The attachments must be operated in accordance with the operating instructions supplied with them.

When using a breaker or other attachment for demolition work where material (e.g. asphalt) is removed and can uncontrollably sputter away, personal protective equipment is to be worn at all times (safety shoes, safety helmet, eye protection, ear protection and, if necessary, a breathing mask). The use of a gravel guard (front protective grid) is recommended. For excavation work with a cab, the front window must be closed, in addition.

For power rating of the auxiliary ports, see the "Technical data" section (page 48).

Make sure that, before carrying out the activities in the auxiliary port connectors, the pressure relief of the hydraulic equipment (page 129) and the auxiliary port connectors (page 129) has been carried out. Depending on the operation setting, the return change valve has to be set to the appropriate position (page 128).

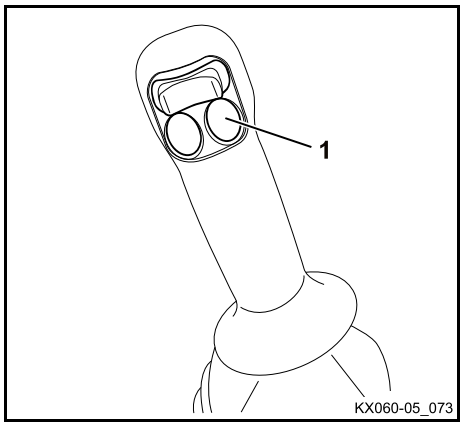
The auxiliary ports may only be activated when an implement is attached.

If the auxiliary ports have not been in use over a long period of time, dirt may have accumulated on the pipe connections. Before installing the attachment, drain approx. 0.1 l of hydraulic oil at each port.

Collect the drained hydraulic oil in a container and discard it in accordance with the valid environmental regulations.

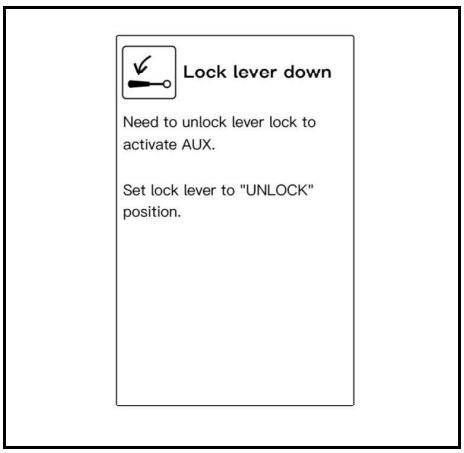
Activating the auxiliary port function

- Turn the starter switch to the RUN position.
- Start the engine (page 94) and idle it until the operating temperature has been reached.
- Lower the control lever lock.
- Press the auxiliary port enable switch (1).



The auxiliary port function is only available when the control lever lock is lowered. If the control lever lock is raised or it is raised during the operation of the auxiliary port, then auxiliary port operation is not possible. The message appears as in the figure on the right.

- *Lower the control lever lock and press the auxiliary port enable switch once again.*

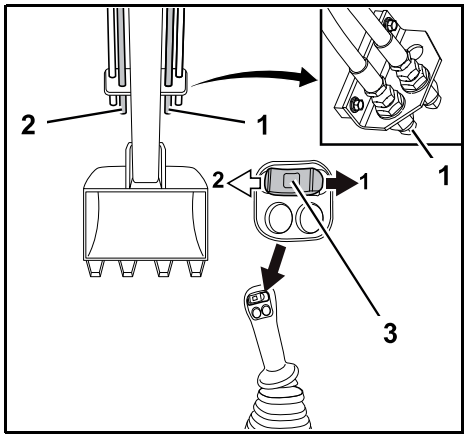


Auxiliary port 1

The following figure illustrates the auxiliary port 1 and auxiliary port 1 rocker switch (3) connectors.

The proportional control enables you to smoothly control the implement speed. Example: If you move the rocker switch half a turn to the left, the implement moves at half speed.

- Move the auxiliary port 1 rocker switch in direction (➔). The oil will flow towards connector (1) on the right-hand side of the arm.
- Move the auxiliary port 1 rocker switch in direction (⇦). The oil will flow towards connector (2) on the left-hand side of the arm.

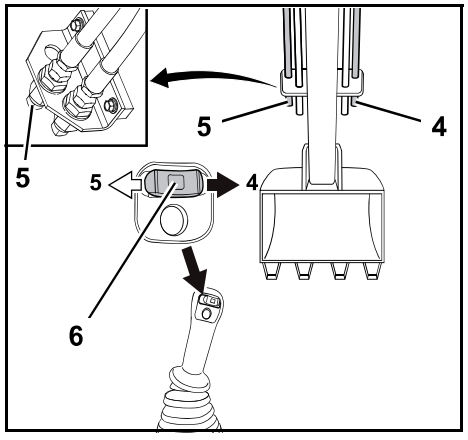


Auxiliary port 2

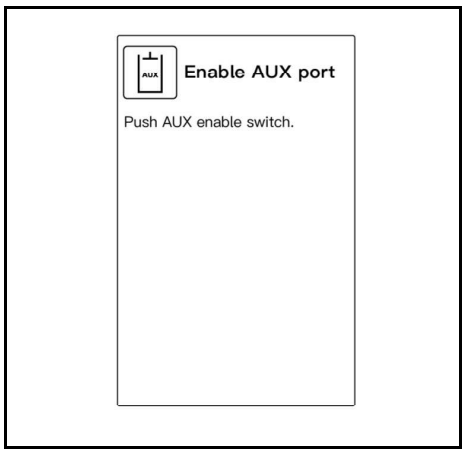
The following figure illustrates the auxiliary port 2 and auxiliary port 2 rocker switch (6) connectors.

The proportional control enables you to smoothly control the implement speed. Example: If you move the rocker switch half a turn to the left, the implement moves at half speed.

- Move the auxiliary port 2 rocker switch in direction (➔). The oil will flow towards connector (4) on the right-hand side of the arm.
- Move the auxiliary port 2 rocker switch in direction (⇦). The oil will flow towards connector (5) on the left-hand side of the arm.



Only when the auxiliary port function is enabled, the rocker switch allows the oil to flow towards the auxiliary port. If this function is disabled, no oil flows towards the auxiliary port.
The message appears as in the figure on the right.
- *Press the AUX enable switch first and then handle the rocker switch.*



One-way hold operation

For one way hold operation, the return change valve has to be set to the direct return flow position (page 128).

The attachment can move in an uncontrolled and sudden manner, there is a danger to life in the working area!
When using optional equipment that is not suitable for continuous oil flows (e.g. Powertilt), using the one-way hold switch poses a danger to life!
The auxiliary port cannot be operated proportionally with the one-way hold switch. The flow volume is adjusted to the highest level in the factory.
- *Before using the one-way hold switch, check that the optional equipment is suitable for use with continuous oil flows.*
- *Before using the one-way hold switch, make sure that nobody is in the working area.*
- *The flow volume of the auxiliary port must be adapted to the optional equipment.*

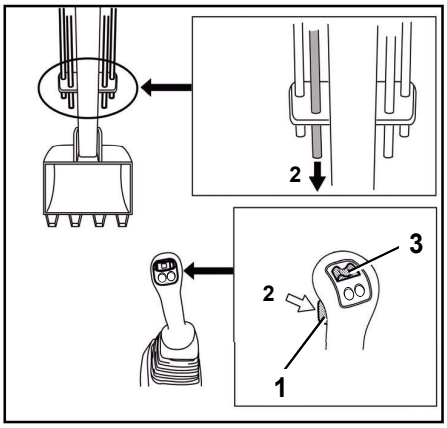
- Activate the operation setting for the "one way flow".

Switching on

- Briefly push the one way hold switch (1). The oil flows on one side to auxiliary port 1 (2) on the left side of the arm.

Switching off

- Briefly press the one way hold switch to switch off the oil flow, or
- press the rocker switch for auxiliary port 1 (3) briefly to the right or left to stop the oil flow.



Operating modes

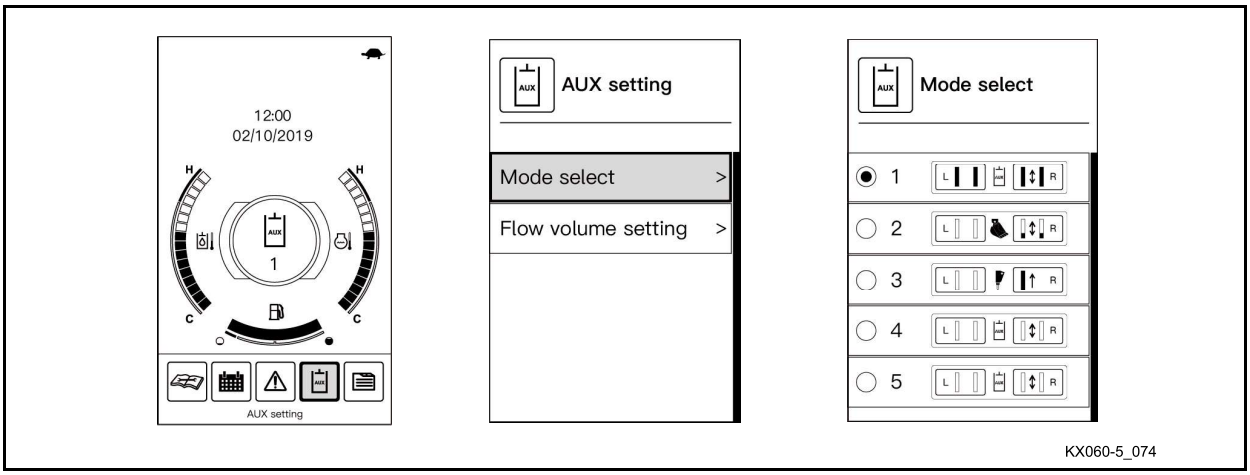
The auxiliary port connector is preset at the factory, enabling five operating modes to be selected.

The operating mode can be changed on the “Mode select” screen (page 124).

The icon and flow rate index in the display change accordingly.

When the starter switch is turned to the RUN position the most-recently used setting is activated.

Select the mode of operation



Mode	AUX port 2	Icon	AUX port 1	Electric return change valve
1	Max. flow rate	Auxiliary port (default)	Max. flow rate	Indirect
2	Not active	Tilt bucket	Limited flow volume	Indirect
3	Not active	Breaker	Flow in one direction (Oil to connector 2 only)	Direct
4	Not active	Auxiliary port (default)	Not active	Indirect
5	Not active	Auxiliary port (default)	Not active	Indirect

- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

The menu bar appears in the display.

- Rotate jog dial to the right until “AUX setting” is selected in the display.
- Press Jog dial (enter switch).

The “AUX setting” appears in the display. (“Mode select” is selected.)

- Press Jog dial (enter switch).

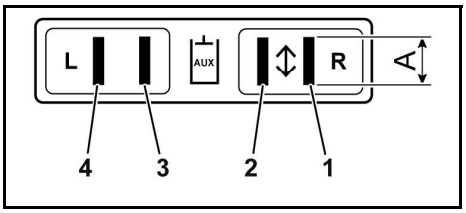
The “Mode select” menu appears in the display.

- Rotate jog dial to the right or the left until the desired mode is selected.
- Press jog dial (enter switch) to confirm.

The icon and flow rate index in the display change accordingly.

The electric return change valve may be interlocked with the operating mode.

The flow rate set for auxiliary port 1 is shown on the right of the display, that of auxiliary port 2 on the left. The height of bar "A" shows the flow rate of the respective connectors (1, 2, 3, and 4).



Flow rate setting

Suppose the same implement has to be attached to a different machine. Even when using identical flow rate settings for the other machine, the working speed may differ. For each machine, you need to individually adjust the flow rate settings. Upon changing the implement, you need to determine and adjust the optimum flow rates for the new implement.

The flow at auxiliary port 1 is not constant when using a different function or if a relief valve is responding.

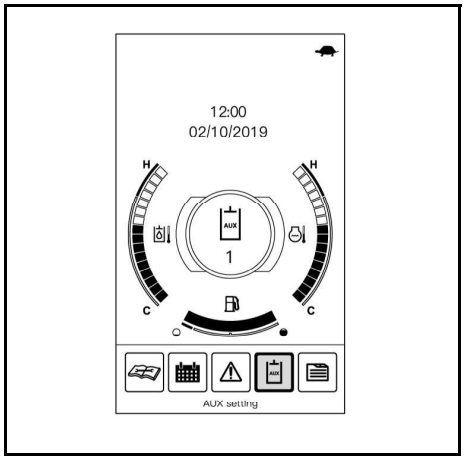
It is recommended to adjust this setting during the operation of the implement.

- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

The menu bar appears in the display.

- Rotate jog dial to the right until “AUX setting” is selected in the display.
- Press Jog dial (enter switch).

The “AUX setting” appears in the display.

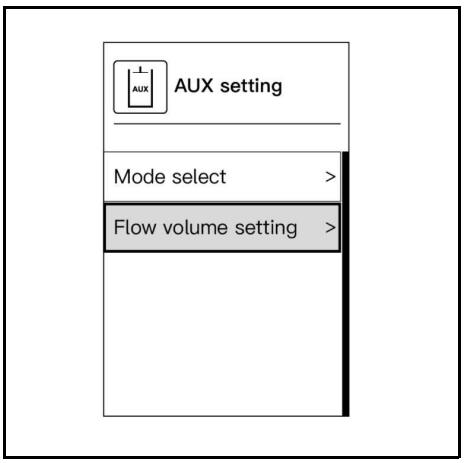


- Rotate jog dial to the right until “Flow volume setting” is selected in the display.
- Press Jog dial (enter switch).

The “Flow volume setting” mode select screen appears in the display.

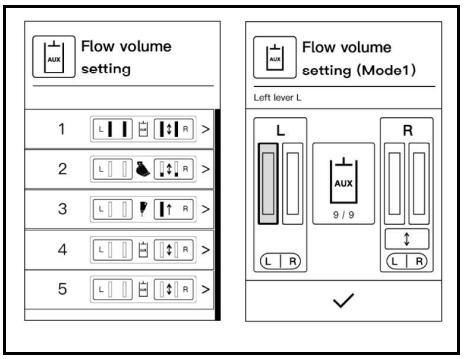
- Rotate jog dial to the right or the left until the desired mode is selected.
- Press Jog dial (enter switch).

The “Flow volume setting” appears in the display.



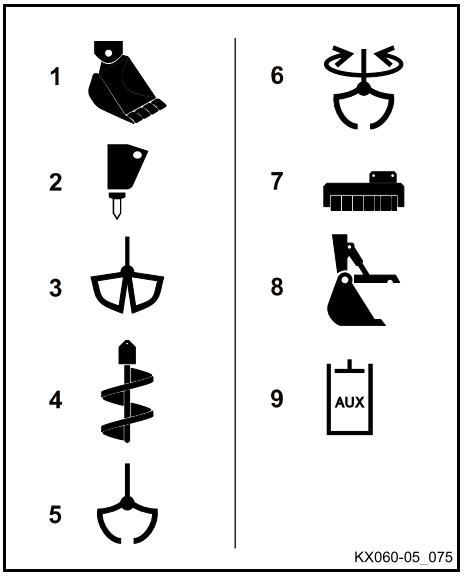
Settings with symbol:

- Rotate jog dial to the right or the left until the icon is selected.
- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left until the desired icon is selected.
- Press jog dial (enter switch) to confirm.



You can select the following symbols:

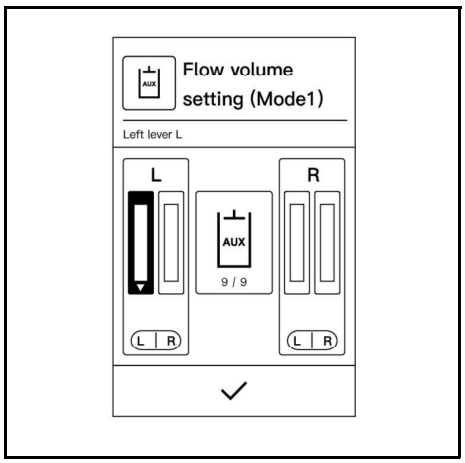
1. Tilt bucket
2. Breaker
3. Dipper bucket
4. Auger
5. Grapple
6. Rotary grapple
7. Brush cutter
8. Thumb
9. Auxiliary port (default)



There is no relationship between the icons and the flow control settings. Select icons to suit the images of attachments to be connected.

The maximum flow rate can be set for each auxiliary port connector.

- Rotate jog dial to the right or the left until the desired bar graph is selected.
- Press Jog dial (enter switch).
- Rotate the jog dial to the right or the left until the bar graph achieves a desired level.
- Press jog dial (enter switch) to confirm.



It is possible that some implements will not be activated even when the bar graph is not at its lowest level.

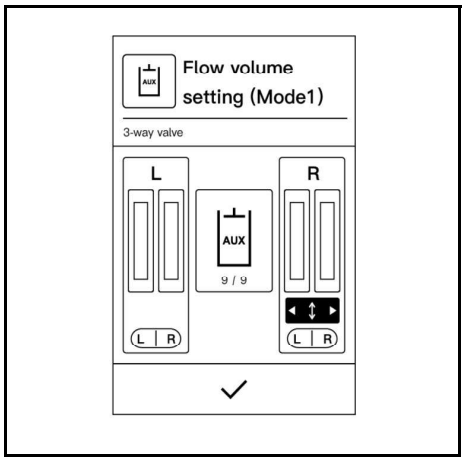
Even when the bar graphs are at the same height, it is possible that the implements will not operate identically.

This does not constitute a malfunction on the machine. In this case, the flow rates must be optimised correspondingly for the implements.

Setting with return change valve:

- Rotate jog dial to the right or the left until the return change valve is selected.
- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left until the desired setting is selected.

Return change valve	Indirect	Direct
Icon	↕	↑



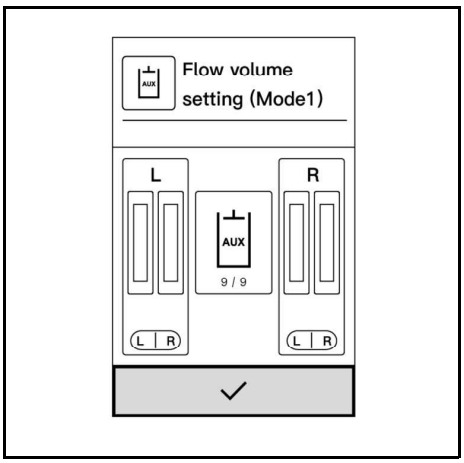
- Press jog dial (enter switch) to confirm.

- Rotate jog dial to the right until ✓ (icon of acknowledge) is selected in the display.
- Press jog dial (enter switch) to complete “Flow volume setting”.

Input can be cancelled at any time.
Changes are then not saved.

- To cancel your input, press return switch.

The display returns to its previous display mode.



Return change valve for direct return flow

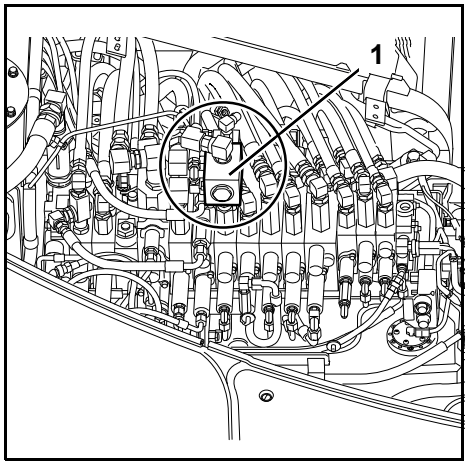
According to the mode of operation of a given attachment, the return flow of the hydraulic oil must occur either via the control valve (indirect return flow) or directly to the hydraulic oil tank (direct return flow). The return flow is mechanically switched by the change valve.

The change valve has two settings:

The "direct return flow" switch position is used for hammering attachments, such as a hydraulic hammer.

The "indirect return flow" switch position is used for rotating attachments, such as a rotary gripper, an auger, etc.

Activating the return change valve



The return change valve is interlocked with the AUX operating mode.

(Described in the “Flow rate setting” section (page 125))

Change the AUX operating mode (return change valve) to the required setting, depending on the action of the attachment being used (rotary or breaking).

When "direct return flow" is enabled, the return flow is directed from the attachment to the hydraulic oil tank via the return filter. The return flow is directed via the right auxiliary port 1 connector at the arm only.

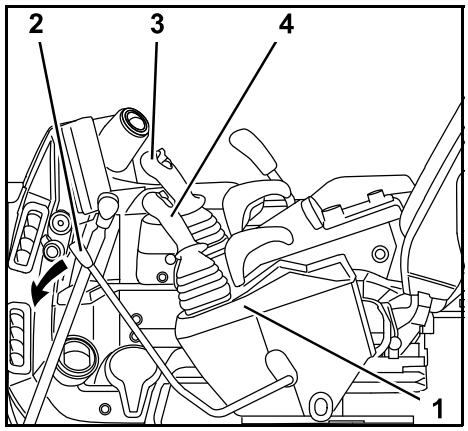
When "indirect return flow" is enabled, the return flow is directed from the attachment to the return filter via the control valve and then to the hydraulic oil tank. In that case, the return flow may use the left or right auxiliary port 1 connector of the arm (depending on the position of the rocker switch for auxiliary port 1).

Depressurising the hydraulic system

Perform the pressure relief procedure immediately after stopping the engine!

- Lower front attachments and dozer completely.
- Turn the starter switch to the STOP position.
- Wait until the engine has come to a standstill.
- Turn the starter switch to the RUN position.

Do not start the engine!



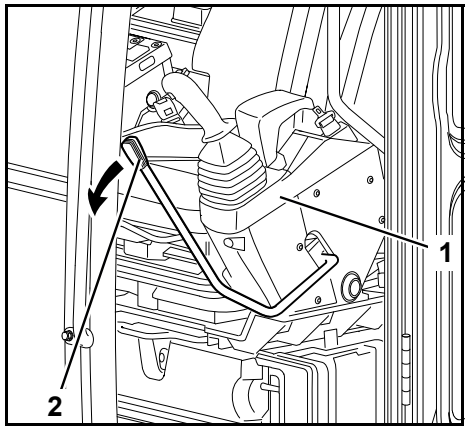
- Lower the left control console (1) and make sure that the control lever lock (2) engages.
- Move control levers (3 and 4) several times to limit stop in all directions.

The hydraulic system has been depressurised.

Depressurising the auxiliary ports

Perform the pressure relief procedure immediately after stopping the engine!

The machine comes with auxiliary port 1 only or with auxiliary port 2 additionally. The following description illustrates the pressure relief process for both auxiliary ports. According to machine equipment, the corresponding description is to be applied.

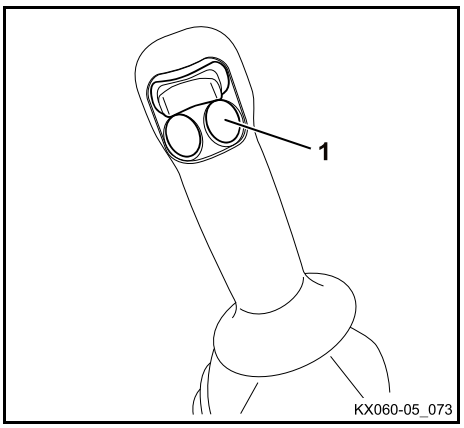


- Lower front attachments and dozer completely.
- Turn the starter switch to the STOP position.
- Wait until the engine has come to a standstill.
- Turn the starter switch to the RUN position.

Do not start the engine!

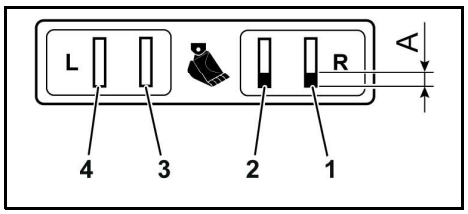
- Lower the left control console (1) and make sure that the control lever lock (2) engages.

- Press the auxiliary port enable switch (1) and turn on the auxiliary port function.



You will see the setting of the flow rates in the display. The bar height "A" shows the flow rate at the respective auxiliary port connectors (1, 2, 3 and 4).

If the bar graph is set to the lowest level (as shown in connector 3, no bar obvious), flow is blocked and there is no oil flow.

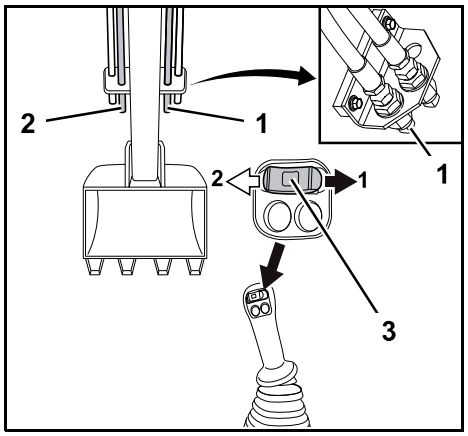


If the flow is blocked, the pressure cannot be relieved completely The hydraulic couplings at the auxiliary port connectors can jam as a result. Then connection or separation of the hydraulic cables of attachments is not possible. Switch to a different mode, if available (page 124), or increase the flow rate (page 125).

- Make sure that the flow rates are not set to the lowest level.

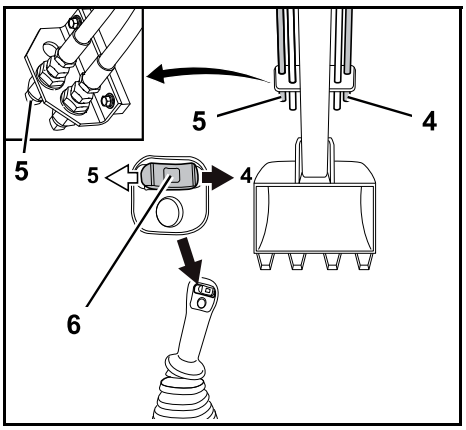
- Rocker switch auxiliary port 1 (3) on the right control lever must be pushed over completely to the right and left.

The auxiliary port connectors (1 and 2) are pressure relieved.



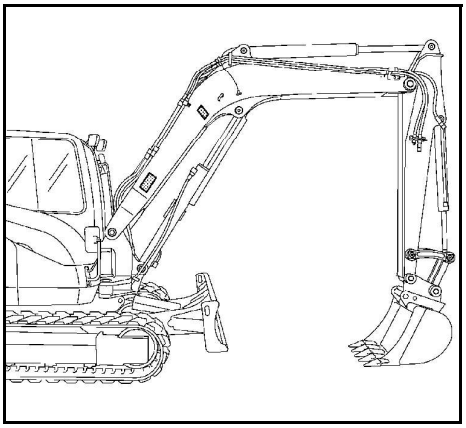
- Rocker switch auxiliary port 2 (6) on the left control lever must be pushed over completely to the right and left.

The auxiliary port connectors (4 and 5) are pressure relieved.



Placing out of operation

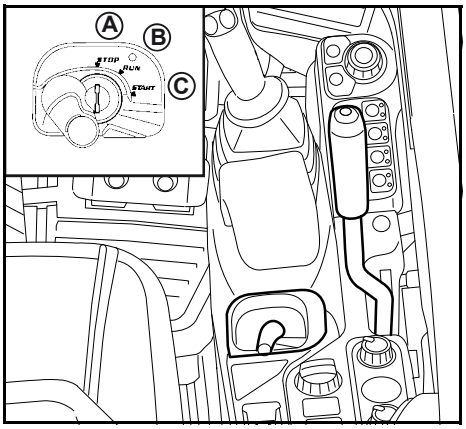
Park the machine in such a way that it cannot move and is secured against unauthorised use.



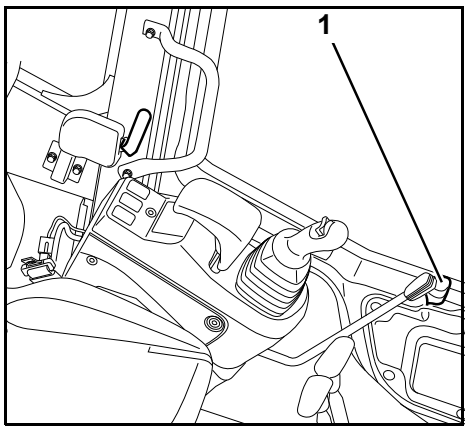
- Drive the machine onto level ground.
- Extend the hydraulic cylinders as follows:

Boom:	Half-extended
Arm:	Half-extended
Bucket:	Half-extended
Dozer:	Lowered to the ground
Swing mechanism:	Front attachments lowered centrally to the ground

- Stop the engine (page 97).
- Remove the key.
- Unbuckle the seat belt and lift the left control console.
- Refuel the machine if necessary (page 144).



- Push the release lever (1) all the way forward and open the door. If the cab door is not closed again right away, lock the door at the cab wall.
- Close and lock the cab door. The key must remain with the operator.
- Check the machine for external damage and for leaks. Any damage or leak must be repaired before the next start.
- In case of a heavy accumulation of dirt in the area of the tracks and hinges at the front attachments, clean the machine (page 174).



Do not park the machine anywhere there are combustible materials such as dried grass and straw.

Operating the heating and air-conditioner system

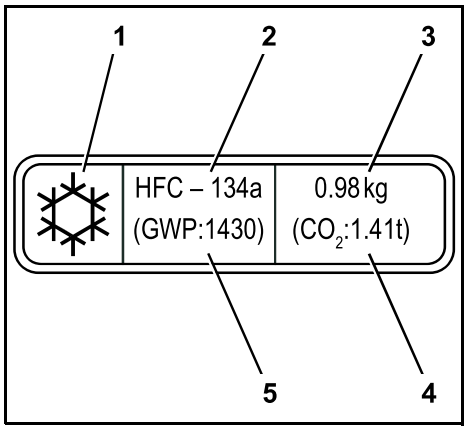
This air conditioner contains fluorinated greenhouse gases (F-gases).

Refrigerant	Amount (kg)	CO_2-equivalent (t)	Global Warming Potential (GWP*)
HFC-134a	0.98	1.41	1430

* GWP = Global Warming Potential

Explanation of the information label:

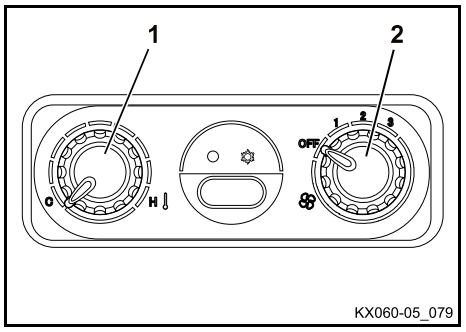
1. Marking that the air conditioner contains F-gas
2. Industrial name of the F-gas that it contains
3. F-gas amount (in kg) in the air conditioner
4. Equivalent mass (in t) of the F-gas carbon dioxide (CO_2)
5. F-gas global warming potential (GWP)



All the heating and air-conditioner system operations described below must be carried out while the engine is running.

Heating the cab

- Set the temperature control (1) to the "Warm" position.
  Blue → Cold
  Red → Warm
- Set the blower switch (2) to position 1, 2 or 3.
- Set the air nozzles to the desired position.

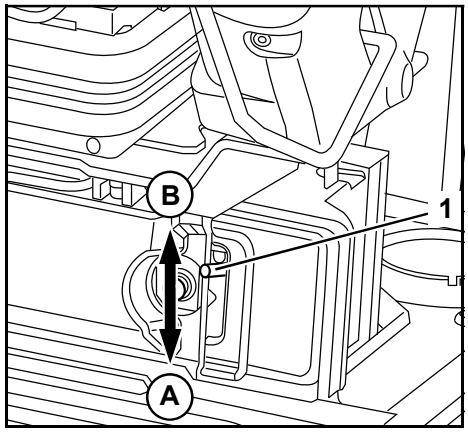


To avoid accumulated heat and damage to the ventilation system, do not cover air nozzles with objects (e.g. bags or clothes) when the heater is on.

- To heat the cab faster, switch aerial supply to position circulating air (B) with lever (1).

No cold outside air will follow and the circulating inside air heats faster.

So that the windows do not steam up at longer operation of the heater, the aerial supply should be switched back to position "fresh air" (A) after the warm-up phase of the cab is complete.



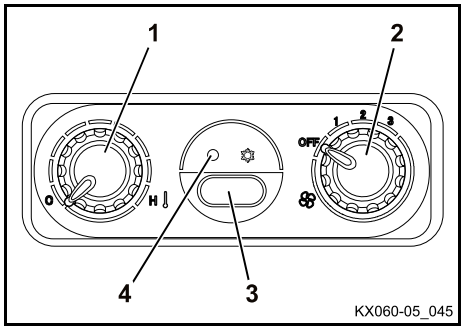
In dusty surroundings, the fresh air supply should be switched on in order to increase the air pressure inside the cab. This contributes to the fact that no dust penetrates into the cab.

STOP

Lasting circulating air mode leads to overtiring of the operator! Circulating air mode for a longer period of time can lead to lack of oxygen and overheating inside the cab. No cool fresh air flows in from the outside. The operator therefore overtires quickly.

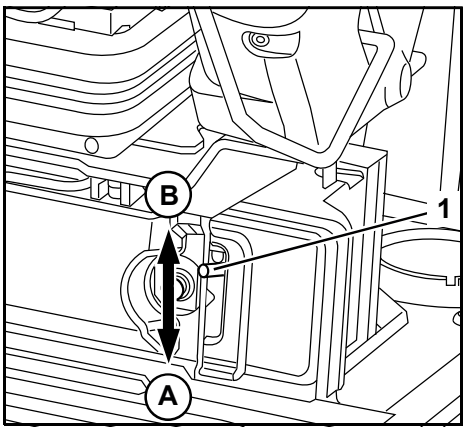
Cooling the cab

- Set the temperature control (1) to the "Cold" position.
  Blue → Cold
  Red → Warm
- Set the blower switch (2) to position 1, 2 or 3.
- Use the air-conditioner switch (3) to switch the system on. The indicator (4) lights up.
- Set the air nozzles to the desired position.



Make sure that the cab door is closed while the heating or air-conditioner system is running.

- To cool the cab faster, set the air supply lever (1) to the recirculated air (B) position.

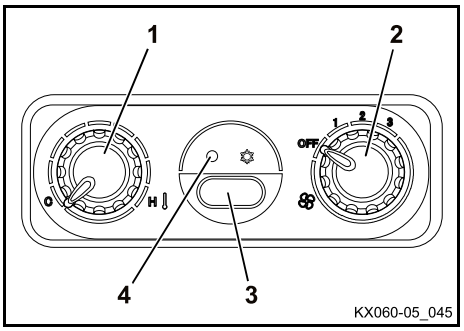


STOP

Lasting circulating air mode leads to overtiring of the operator! A lasting use of the circulating air mode may cause a lack of oxygen inside the cab. No cool fresh air flows in from the outside. The operator therefore overtires quickly.

De-icing or demisting the windows

Proceed as follows to de-ice the windows or clean them of condensation:



- Set the temperature control (1) to the "Warm" position.
  Blue → Cold
  Red → Warm
- Set the blower switch (2) to the 3 position.
- Use the air-conditioner switch (3) to switch the system on. The indicator (4) lights up.

The air-conditioner will dehumidify the cab air.

Make sure that the cab door is closed while the heating or air-conditioner system is running.

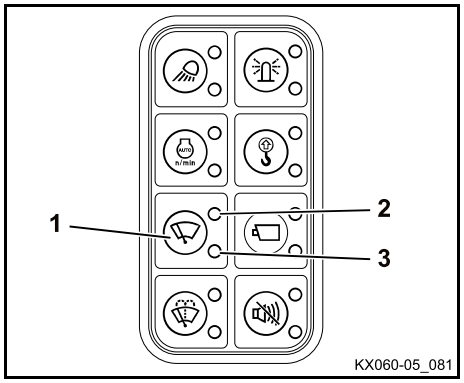
- Direct the air nozzles towards the front window.
- After defogging the windows, the air conditioner may be turned off. To do so, press the A/C switch; the indicator in the A/C switch will turn off.

Operating the wiper/washer system

Risk of damage to components!
When you turn on the wiper while the windscreen is opened, the wiper can hit the adjacent cab components causing damage to the wiper.
- *Do not turn on the wiper switch while the windscreen is open.*

Switching on the windscreen wiper

- The starter switch is in the RUN position.
- Press the switch (1) to activate the windscreen wiper.



Pressing once: The wiper activates itself intermittently. The upper indicator (2) will light up.

Pressing twice: The wiper activates itself continuously. The lower indicator (3) will light up.

Pressing three times: The wiper stops itself. The indicators (2) and (3) will go out.

In extremely cold weather conditions, make sure the wiper rubber does not stick to the window. This can damage the wiper rubber or the wiper motor.

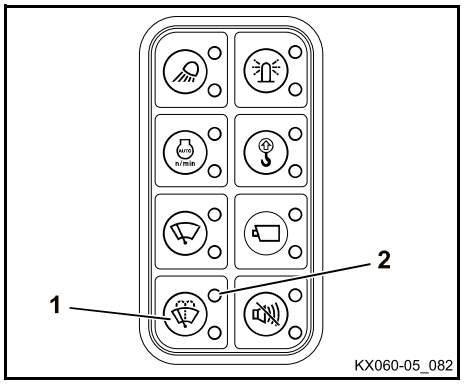
Only switch on the wiper when the window glass is wet. If necessary, switch on the washer system first.

To turn on the washer system

Press the switch (1) to activate the washer system.

The washer system runs for as long as the switch is held down. The indicator (2) lights up. Hold down the switch longer, and the wiper will get started. Release the switch, and the wiper will swing several times and stop itself.

Do not operate the washer system if its reservoir is empty as running dry could damage the pump.

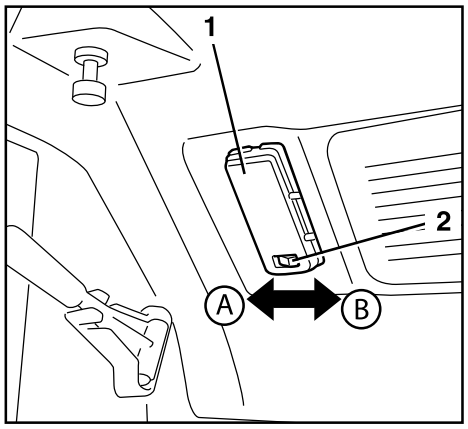


Operating the room light

- Press the switch (2) to the ON (A) position.

The interior light (1) is illuminated as long as the switch remains in this position.

- To switch off, press the switch (2) to the OFF position (B).



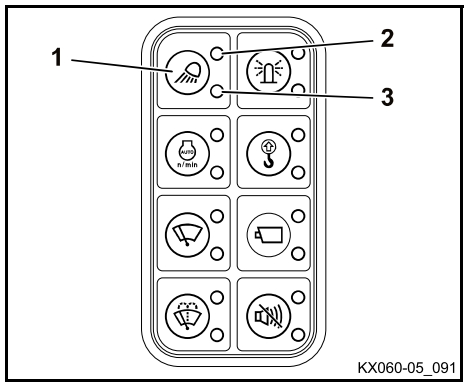
Operating the working light

- The starter switch is in the RUN position.
- Press the switch (1) to turn on both the instrument lighting and the working lights.

Pressing once: The boom's working light turns on. The upper indicator (2) will light up.

Pressing twice: The boom's and cabin's working lights and rear light turn on. The upper indicator (2) and the lower indicator (3) will light up.

Pressing three times: The boom's and cabin's working lights and rear light turn off. The indicators (2) and (3) will go out.

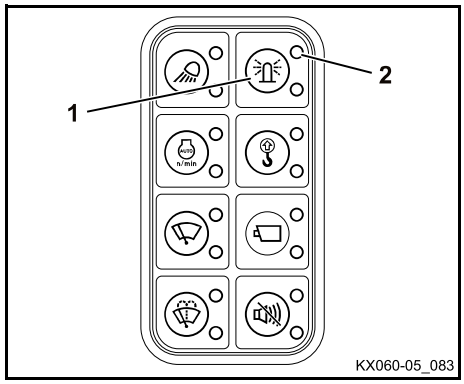


During work on public roads other road users must not be blinded.

Operating the rotary beacon (optional equipment)

- The starter switch is in the RUN position.
- Press the switch (1) to turn on the rotary beacon. The indicator (2) will light up.

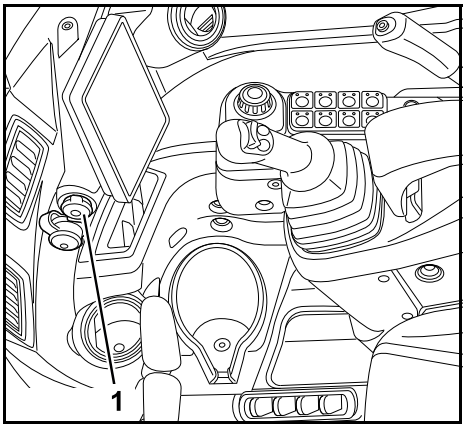
Press the switch (1) again to turn off the rotary beacon.



Operating the 12 V plug

- Open the cover cap (1) and put the load into the 12 V plug.

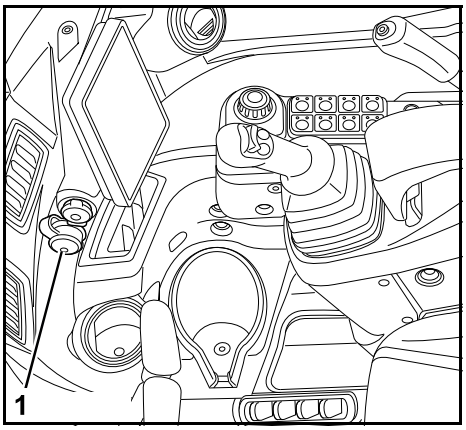
The rated current of the connected load must not exceed 10 A.



Operating the USB outlet

- Open the cover cap (1) and put the load into the USB (Type-A) outlet.

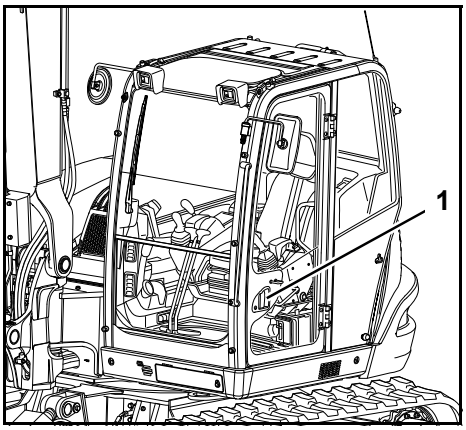
The rated current of the connected load must not exceed 2 A.



Opening and closing the cab door

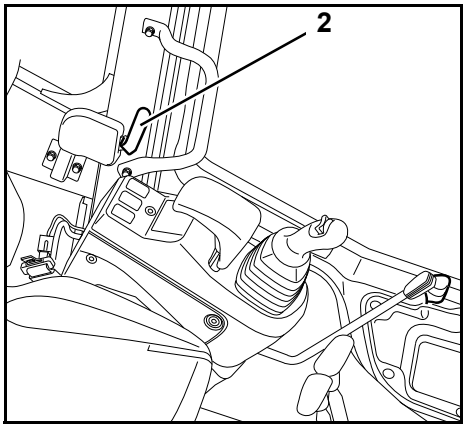
Opening the cab door from outside

- Unlock the cab door at the door lock.
- Open the cab door by pulling at the door handle (1) and arrest it at the cab wall.



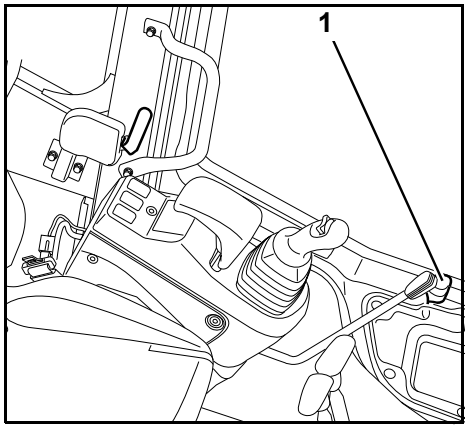
Closing the cab door

- Press down the release lever (2) and pull the cab door into the lock.



Opening the cab door from the inside

- Push the release lever (1) all the way forward and open the door. If the cab door is not closed again right away, lock the door at the cab wall.

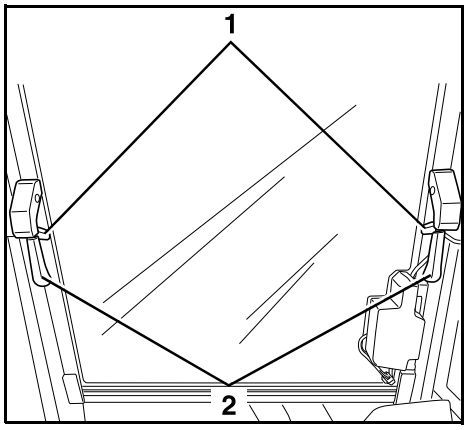


Opening and closing the windows

Front window

Always lock the front window. Do not stay in the cab and operate the machine with the front window unlocked. When opening the window, always keep both hands on the grips (2) to prevent injury by pinching or crushing.

The front window is opened and closed from the operator's seat.



Opening

- Press the right and left lock bars (figure above/1) inwards simultaneously and push the front window upward at both grips (figure above/2) in the guide rails as far as the stopper. Lock the front window at the endpoint. Check that the front window is locked.

Do not release the handles when raising the window as the front window could suddenly rise in an uncontrolled way and strike the operator's head. Please follow the safety instructions on the side window.

Closing

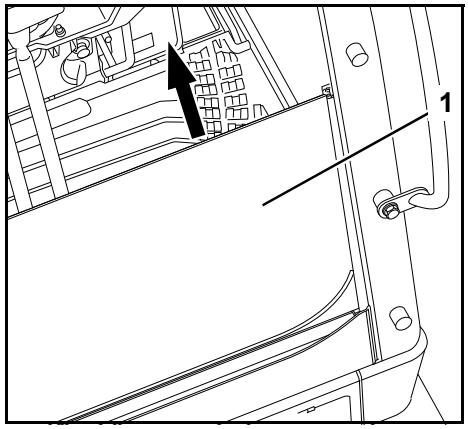
- Press the right and left lock bars (figure above/1) simultaneously and, using both grips (figure above/2), push the front window forward within the guide rails up to the stopper. Lock the front window at the stopper by releasing the lock bars. Check that the front window is locked.

Front window base

Removal

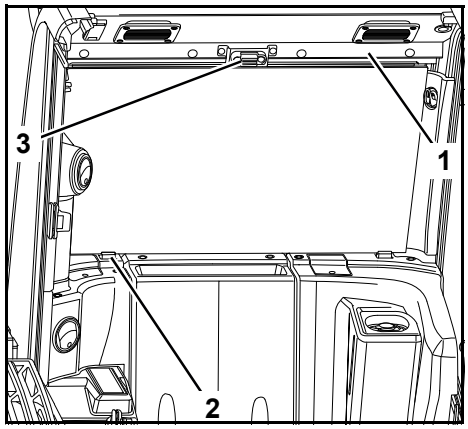
The front window must be opened and the backrest must be folded completely forward.

- Lift the front window base (1) upwards to remove it from the window frame.



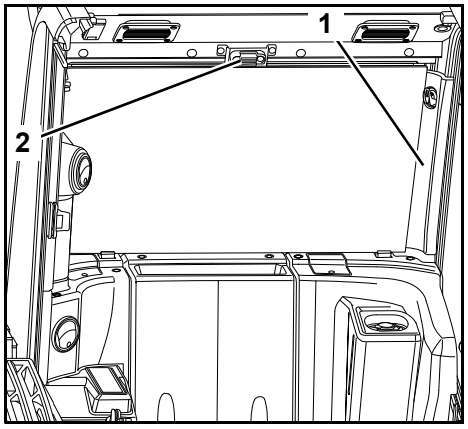
- Carefully insert the front window base (1) into the fixings (2) at the cab back wall and into the locking mechanism (3) until it snaps.

Note that the glass pane may fall down - risk of injury! *If the glass pane is not locked securely, it can fall down and cause severe injuries.*
Make sure that the glass pane is properly engaged in the locking mechanism.



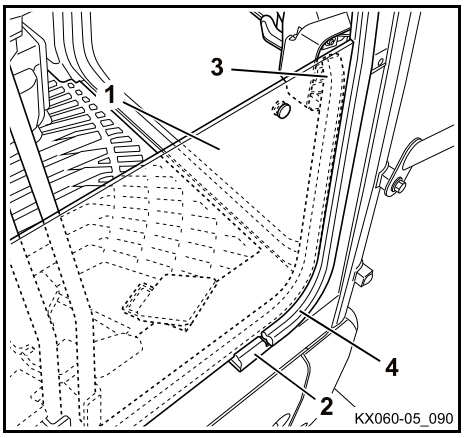
Installing

Check that the front window is opened before installing.



- Firmly hold the front window base (1) against the cab back wall with one hand.
- Loosen the locking mechanism (2) and carefully remove the front window base from the cab back wall.

Note that the glass pane may fall down - risk of injury!
Running into something can cause the glass pane to fall out of your hands and against your body.
Be careful when moving with the glass pane inside the cab.

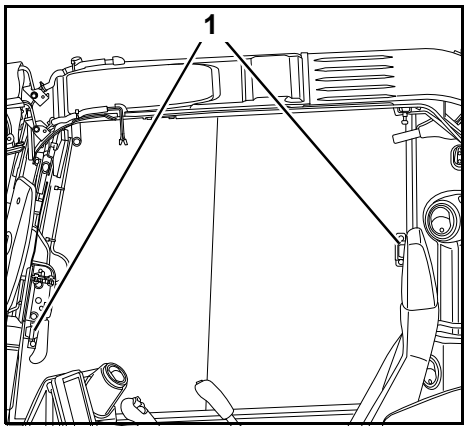


- Carefully slide the front window base (1) from above into the front window frame (3).
- Make sure that the window pane is sliding into position in front of the rubber seal (4).

Caution, slamming the glass pane violently can damage it!
Firmly grasp the glass pane and slide into position with care.

- Carefully place the front window base on the rubber blocks (2).

Side window



- Pull the grip (1) to release the lock and pull side window open to the rear or to the front.
- To close the side window, slide it forward or backward until the lock snaps in at the window frame.

Cold weather operation

Operating the machine at an ambient temperature below 5 °C is considered cold weather operation.

Necessary preparations prior to the winter season

- If necessary, replace the engine oil and hydraulic oil with those of the viscosities specified for winter.
- Only use regular diesel fuel with winter additives. Do not mix petrol and diesel fuel.
- Check the battery's state of charge. In case of extremely low temperatures, it may be necessary to remove the battery after work and store it in a heated room.
- Check the antifreeze strength in the cooling system (page 175). If necessary, add antifreeze until the protection ranges from -25 °C to -40 °C.
- Apply talcum powder or silicone oil to all rubber seals at the windows, the cab door and the side window guide rails.
- Lubricate all locks, except the starter switch, with graphite lubricant.
- Grease the cab door hinges.
- Fill the washer system with an antifreeze window cleaner (page 144).

Operation during the winter season

- The machine must be cleaned after work is finished (page 174); special attention must be paid to the crawlers, the front attachments and the piston rods of the hydraulic cylinders. If the machine is cleaned with a water jet, it must then be parked in a dry, frost-free and well-ventilated enclosed space.
- If necessary, park the machine on boards or mats in order to prevent freezing to the ground.
- Before starting, check if the piston rods of the hydraulic cylinders are free of ice to avoid damage. Also check if the crawlers are frozen to the ground. If so, do not take the machine into operation.

Be careful when getting on and off, the crawler could be slippery.

- Start the engine (page 94) and let it idle until the engine has reached the outside temperature. Before you start working with the front attachments, warm up the machine until the operating temperature has been reached.

Jump-starting the machine

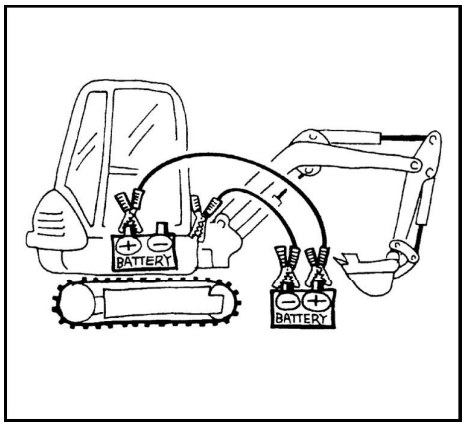
Only a vehicle or starting device with a 12 V power supply may be used.

The operator must remain seated on the operator's place, the battery jumper cables must be connected by a second person.

- Make the battery accessible, and remove the positive terminal cover.
- Position the other vehicle or starting machine beside the machine.

Only use cables with an appropriate cross section as jumper cables.

- Connect the positive terminal of the machine battery to the positive terminal of the helping vehicle (see figure).
- Connect the negative terminal of the helping vehicle to the frame of the machine. Do not use the negative terminal of the machine battery. The connecting point on the frame must be blank and clean.



- Start the helping vehicle and let it run at a higher idle speed.
- Start the engine (page 94) and let it idle. Check if the charge lamp turns off after starting.
- Disconnect the jumper cable on the frame of the machine first, and then on the negative terminal of the helping vehicle.
- Disconnect the second jumper cable from the positive terminal of the machine battery first, and then from the positive terminal of the helping vehicle.
- Place the positive terminal cover onto the machine battery.
- If the jumper cables will be required for the next start of the machine, check the battery and the alternator's charging circuit, contact skilled personnel, if necessary.

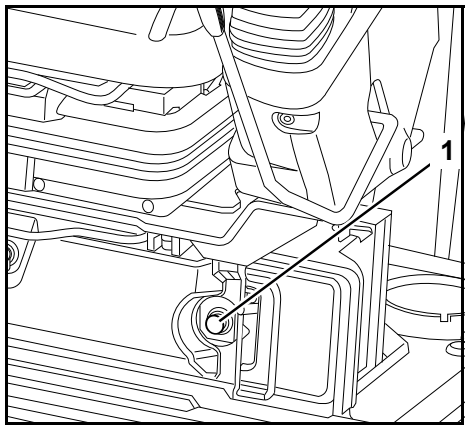
Operating in emergency situations

In case of emergency, you can switch off the engine and lower the boom and the arm manually.

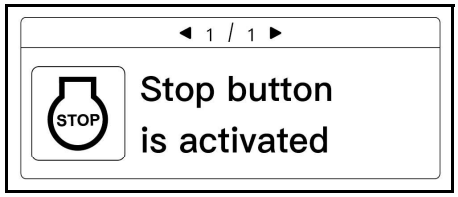
Engine emergency stop

If the engine cannot be stopped with the key, it can be stopped manually.

- To stop the engine, pull the knob (1) until the engine stops.
- After the engine has stopped, push in the knob.



If the engine stop button is activated, a message will appear on the display as shown in the figure on the right.



The machine may only be taken back into operation after the malfunction has been eliminated.

Emergency lowering of the front attachments

The boom and the arm can be lowered in case of an engine failure or a malfunction of the hydraulic system.

- The starter switch is in the RUN position.
- If necessary, lower the boom and the arm using the control levers (page 115) as described in the "Operating the controls during excavation work" section.

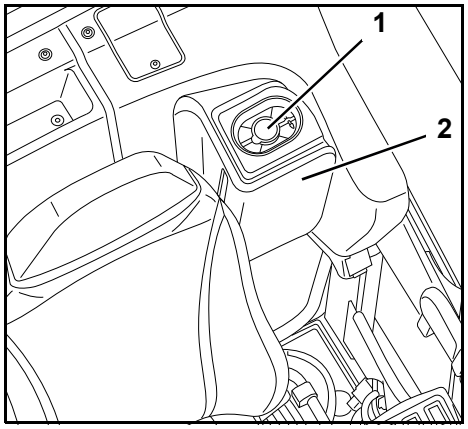
Make sure nobody is standing in the lowering area before starting the emergency lowering procedure.

The lowering function is available only for a short time, as it is controlled by the accumulator in the hydraulic system. The cylinders extend or retract by force of gravity.

Filling up the washer system (cab version)

- Open the cap (1) of the washer system reservoir (2) and add water or a cleaning agent.

In winter, use a cleaning agent with antifreeze.



Refuelling the machine

When refuelling the machine, smoking, an open flame, or other sources of ignition are not allowed. The danger zone has to be clearly marked with signs. A fire extinguisher must be kept at hand in the danger zone.

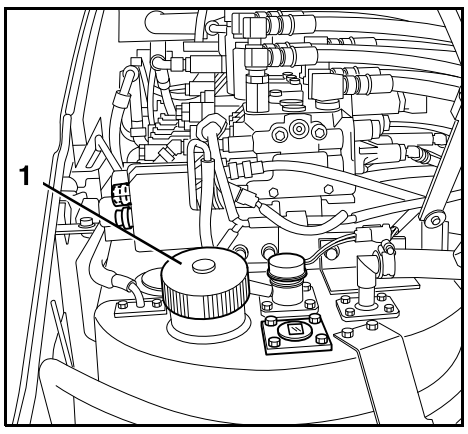
Spilled fuel must be bound immediately with an oil binding agent. The contaminated oil binding agent must be disposed of in accordance with the applicable environmental regulations.

If no pumping station is available, the diesel fuel may only be stored in approved canisters.

Refuel the machine in time so that the fuel tank is not running empty. Air in the fuel system can damage the fuel injection pump.

While refuelling, be careful not to allow dust or dirt into the fuel tank.

- Stop the engine.
- Open the valve chamber cover (page 150).
- Open the filler cap by turning it anticlockwise.
- Fill diesel fuel up to the base of the filler neck.
- Screw on the filler cap and close the valve compartment cover.



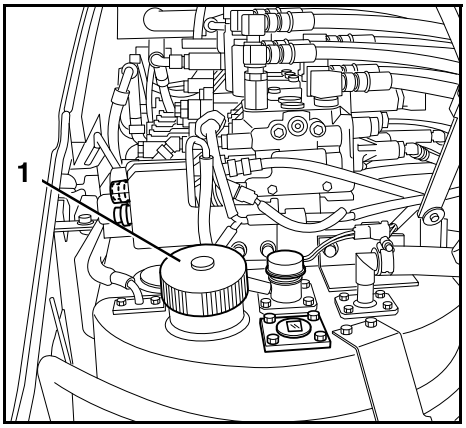
Refuelling the machine using the suction pump

If the machine is equipped with a suction pump, you can refuel it directly from a barrel or a jerrycan.

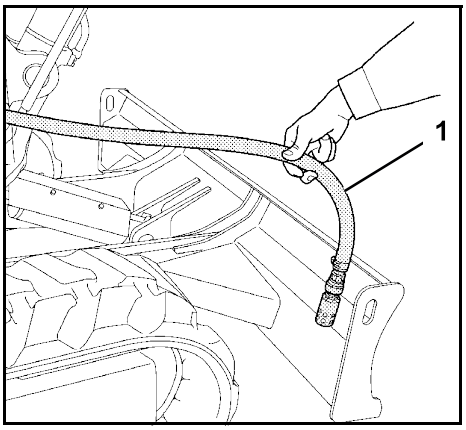
The same safety rules apply as for refuelling the machine.

Use the suction pump only for pumping diesel fuel. Do not use for any other liquids!

- Stop the engine.
- Open the valve chamber cover (page 150).
- Remove the filler cap (1) by turning it anticlockwise.



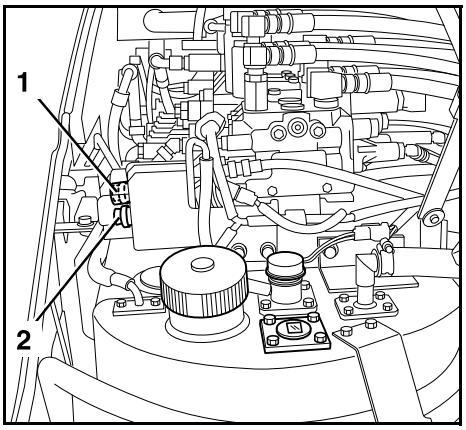
- Remove the suction hose (1) from the mounting and put it into the jerrycan.



- Switch on the suction pump. To do this, press the black button (1).

Upon reaching the maximum fill level, the suction pump will automatically switch off.

- To switch it off manually, press the red button (2).
- Screw on the filler cap and close the valve compartment cover.



Bleeding the fuel system

If the fuel tank was run empty or if work was performed on the fuel system, then the fuel system has to be bled.

- To bleed the fuel system, move the starter switch to the RUN position.

The electrical fuel pump will bleed the fuel system automatically within approx. 60 s.

- If the bleeding was insufficient, the engine will stop again. In this case repeat the procedure.

Replacing the fuses

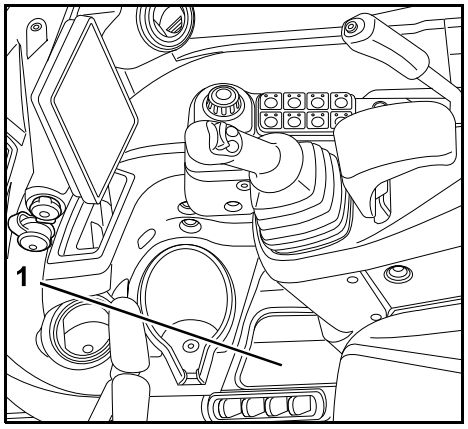
Blown fuses may only be replaced with fuses of the same type and same rating.

The bypassing of fuses, for example with a wire, is not allowed.

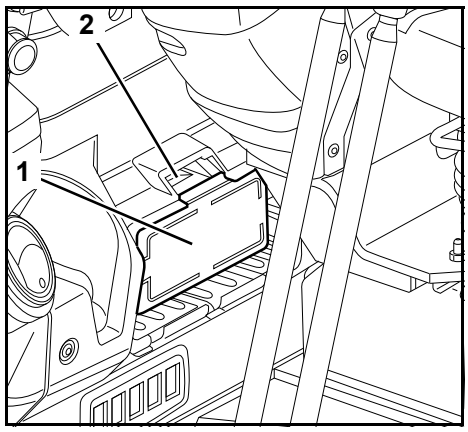
If the malfunction cannot be remedied by replacing the fuse, or if the fuse blows again when starting, contact skilled personnel.

The main fuses (page 148) of the machine are situated above the battery.

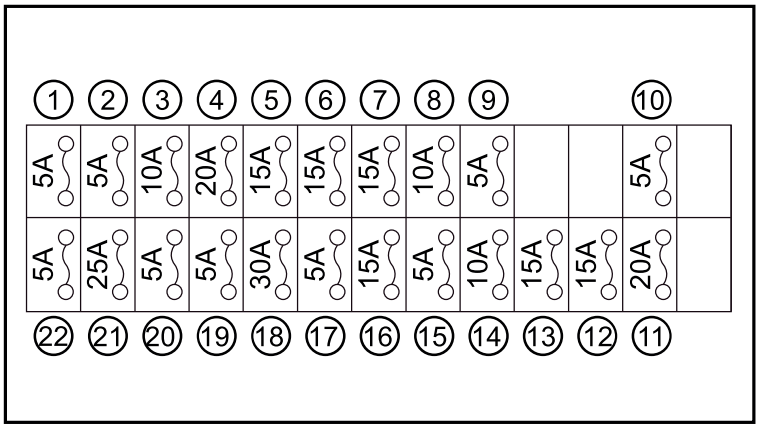
- Remove the fuse box cover (1).



- Remove the cap (1) from the fuse box (2).
- Remove the blown fuse from the fuse box and replace it.
- The fuse layout is shown in the figure below.



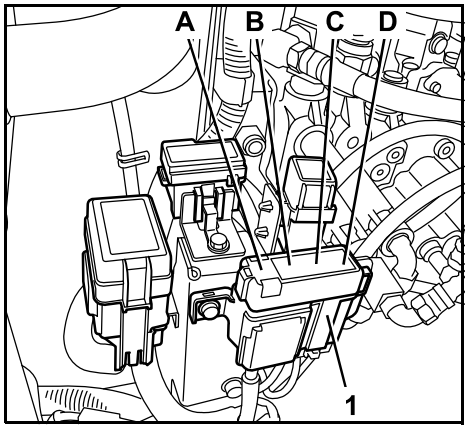
Fuse layout of the fuse box



1	ECU Main (AC)	12	Front Work Light
2	Control lever lock	13	Beacon 2
3	Alternator	14	Horn
4	Seat	15	K-OBD
5	12-V electrical outlet	16	Beacon
6	Wiper/Washer system	17	Horn Switch
7	Radio (AC)	18	ECU Main (Power)
8	Compressor	19	ECU LED (+B)
9	Fuel Pump	20	A/C Controller
10	Starter	21	Blower motor
11	Cab Work Light	22	Room Light

Main fuses

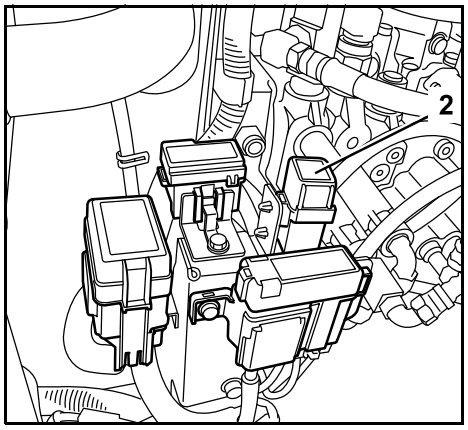
- Remove the blown main fuse from the main fuse box (1) and replace it.



Fuse layout:
(A) Alternator (100 A)
(B) Engine control unit (30 A)
(C) Main fuse (60 A)
(D) Engine cut-off switch (50 A)

Electric blower fuse

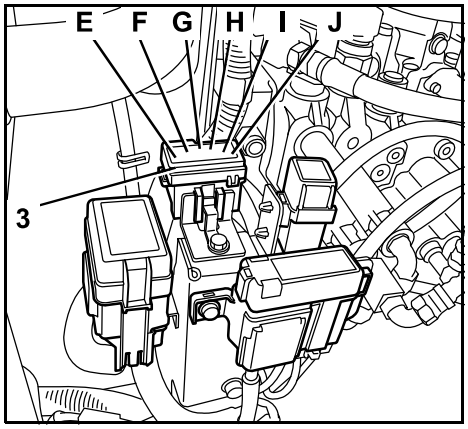
- Remove the blown fuse from the fuse box (2) and replace it.



Fuse layout:
Electric blower (20 A)

Fuel system and engine control fuses

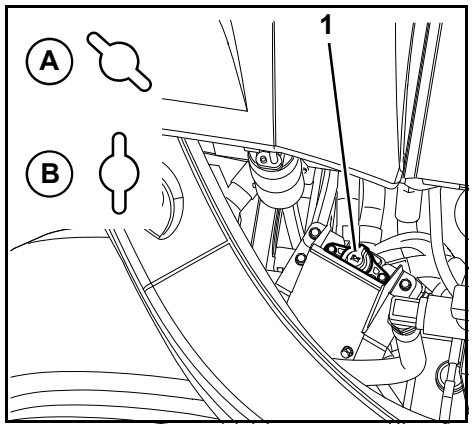
- Remove the blown fuses from the fuse box (3) and replace them.



Fuse layout:
(E) Fuel filter heater (20 A)
(F) Suction pump switch (5 A)
(G) Suction pump relay (30 A)
(H) Fill level monitor (5 A)
(I) Air mass sensor (5 A)
(J) Control unit (+B) (10 A)

Operating the battery isolator

In order for the machine to be operated, the battery isolator (1) must be in the ON position.
(A) OFF
(B) ON

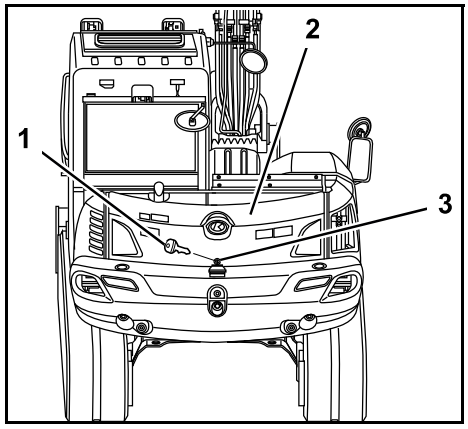


If the battery isolator is in the OFF position, most of the electrically powered functions will be turned off (e.g. horn, working lights, etc.).

The user settings for the display and control unit are saved, and the battery discharges itself only minimally.

Opening and closing the engine compartment cover

Risk of injury by engine compartment cover swinging upwards!
Putting up the engine compartment cover is supported by a gas spring. The engine compartment cover can suddenly swing upwards when opening it!
Always hold on to the engine compartment cover while opening it and move it upwards slowly.



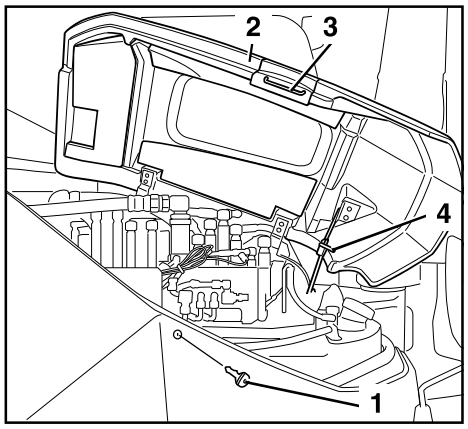
- Insert the ignition key (1) into the lock of the engine compartment cover (2), turn it clockwise and then push in the lock cylinder.
- Swing the engine compartment cover all the way up using the handle (3).

The engine compartment cover is supported by a gas spring that keeps it up once it is open.

Pay attention to the fact that the gas spring holds the engine compartment cover up safely. If the engine cover is unexpectedly slammed shut, for example by another person or by the wind, serious injury could result.

- For closing the engine compartment cover, pull it down and into the lock.
- Turn the key anticlockwise to lock the engine compartment cover.
- Pull out the key.

Opening and closing the valve chamber cover

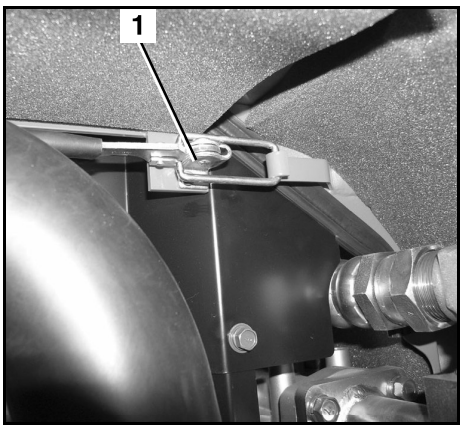


- Insert the ignition key (1) into the lock of the valve compartment cover (2), turn it clockwise and then push in the lock cylinder.
- Pull the handle (3) and swing the valve compartment cover all the way up.
- The catch (4) snaps into place automatically as soon as the valve compartment cover is released in the upper position.

Make sure that the catch has snapped into place properly. If the cover is unexpectedly slammed shut, for example by another person or by the wind, this could lead to serious injury.

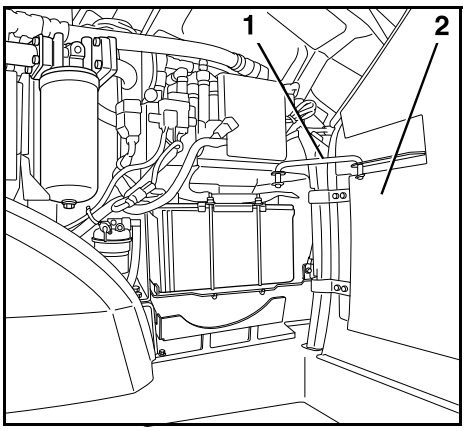
- To close the valve compartment cover, raise it and lift the catch to unlock it.
- Close the valve compartment cover and press to snap it into the lock.
- Turn the key anticlockwise to lock the valve compartment cover.
- Pull out the key.

Opening/closing the side cover



- Open the valve chamber cover (page 150).
- Open the engine compartment cover (page 149).
- Open the clamp (1) and unhook the side cover hook.

- Swing side cover (2) aside until the locking device (1) engages.



Make sure that the catch has snapped into place properly. If the cover is unexpectedly slammed shut, for example by another person or by the wind, this could lead to serious injury.

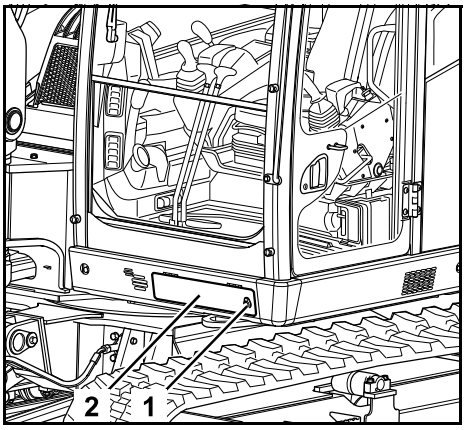
- For closing, pull the locking device (1) from the catch.
- Close the side cover (2) and secure it with the clamp.

Make sure that the clamp is closed properly.

- Close the engine compartment cover.
- Close the valve chamber cover.

Opening/closing the tool compartment

- Insert the key in the lock (1) of the cover (2) and turn it clockwise.
- To open, raise the cover.

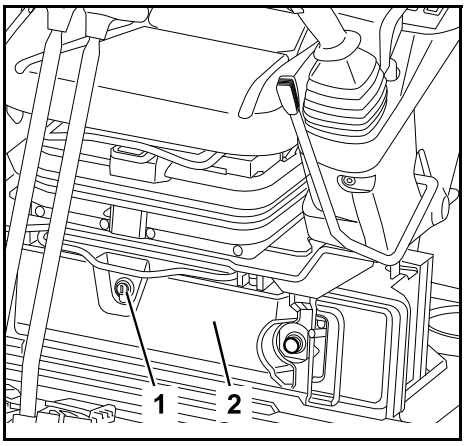


The cover has no catch! The cover falls off upon release, which can lead to hand injuries during clamping.

- To lock the cover, lower it again and turn the key anticlockwise.
- Pull out the key.

Opening/closing the heating and air conditioner unit service cover

- Insert the key in the lock (1) of the cover (2) and turn it anticlockwise.
- Open the cover.
- To lock the cover, close it again and turn the key clockwise.
- Pull out the key.



Replacing the bucket

When replacing the bucket, make sure to wear eye protection, a helmet and protective gloves.

During attaching and detaching, chippings and burrs may appear on the bolts or bushings. These may cause severe injuries.

Never use your fingers for the alignment of the components (linkage, bucket, arm). The components may sever your fingers by uncontrolled movements.

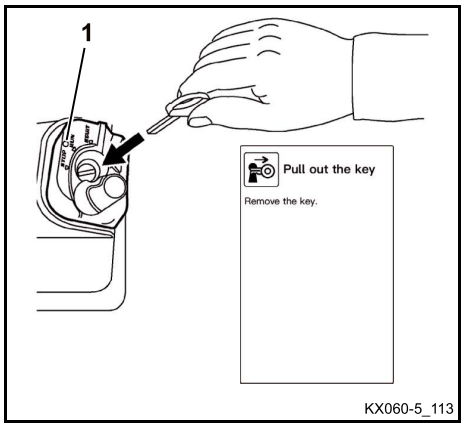
Anti-theft system

The machine is equipped with an anti-theft system that restricts the engine to be started using a registered key only. If a registered key gets lost or stolen, you can invalidate it. This will prevent the engine from being started with this key, thus protecting the vehicle against theft. The anti-theft system makes it difficult to steal the machine.

If the starter switch is set to STOP, the indicator light (1) is illuminated, indicating the activation of the anti-theft system.

Make sure that the indicator light is illuminated when leaving the machine.

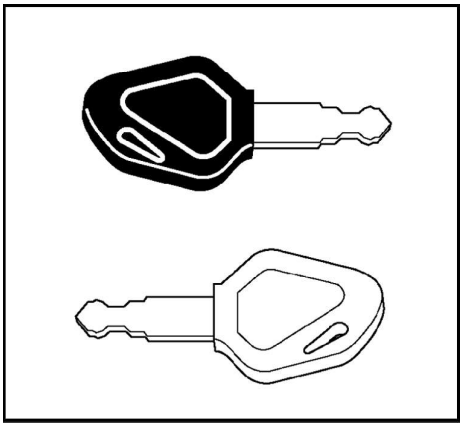
If the starter switch with key inserted is set to STOP when leaving the machine, an acoustic signal will sound as a warning and the message "Pull out the key" is shown in the display.



The vehicle comes with two different types of keys:

Black (individual) key

- This key is used to start the engine.
- The engine can be started by inserting the key and turning it to the START position.
- To be able to start the engine with a black key, it must be registered using the red key.



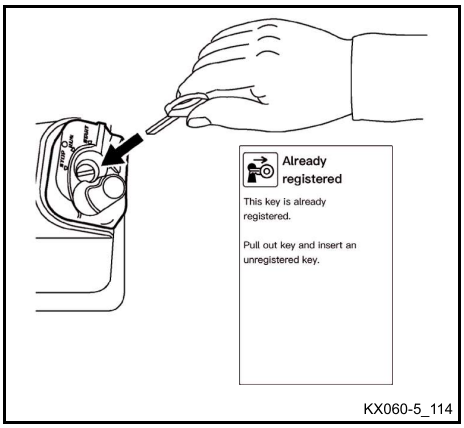
The engine can be started only with a key that was registered for the particular vehicle.
The scope of delivery includes two black keys, among them a spare key. The two black keys have already been registered. Up to four keys can be registered.

Red key (for registering)

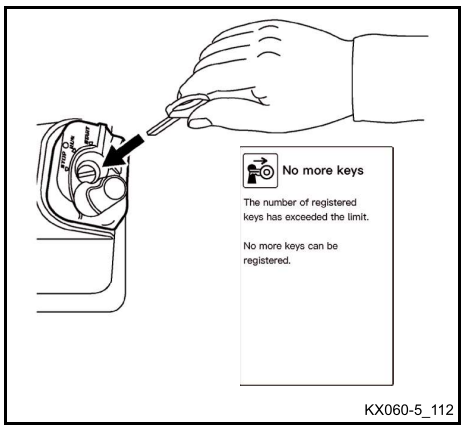
- If one of the black keys is lost, another black key can be registered using the red key (page 155).
- The engine can not be started with the red key.

The key system

- If a registered key is lost, the second and new black key must be re-registered. This procedure locks the lost or stolen black key, which can no longer be used to start the engine.
- If the red key is lost, the black keys can no longer be re-registered. Be sure to keep the red key in a secure location (such as a safe in the office). If it should get lost nevertheless, please contact your KUBOTA dealer immediately.
- If six times attempts are made within one minute to turn the starter switch to the START position with a wrong or unregistered key, an acoustic signal will sound for 30 seconds. The signal will continue to sound even if the starter switch is turned to the STOP position again or the key is removed within this time period. When a key registered for this machine is inserted into the starter switch, the acoustic signal will be turned off.
- Do not use several of these keys in a bunch. This could lead to electrical interfering frequencies which might prevent the motor from starting.
- Use only the special KUBOTA key ring. Other key rings can lead to signal failures between the key and starter switch, and the engine can possibly not start or a key registration cannot be performed.
- After receiving the set of keys, separate them from each other. Always make sure the keys are not part of a bunch. If one of the black keys, for example, is inserted into the starter switch, the red key might be detected by the electronic system. This might lead to a failure of the electronic system.
- If machine malfunctions occur, please contact your KUBOTA dealer immediately in order to have the malfunction localised and remedied.
- Messages in the display can be shown in 11 languages. Your KUBOTA dealer can assist you in your language selection.
- If you erroneously attempt to register a black key that has already been registered, the display will show the "Already registered" message and registration cannot be carried out.



- If you attempt to register a fifth black key, the display will show the "No more keys" message and registration cannot be carried out.



Registering a black key for the machine

Register a black key only under the following conditions:
Make sure that there are no persons within the machine's working area. It is essential to warn persons in the vicinity of the machine by briefly honking the horn.

Make sure that all operational controls are in the neutral position.

Starting the machine is only allowed when the operator is sitting on the operator's seat.

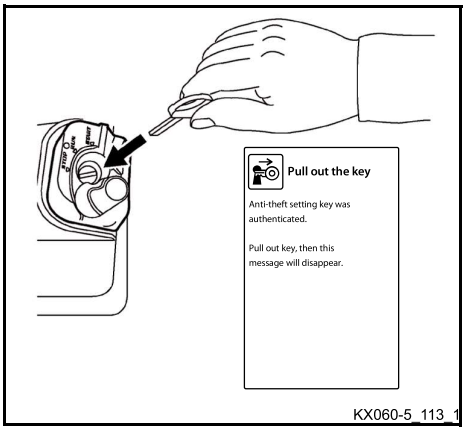
Do not allow the engine to run indoors, unless the room is equipped with an exhaust gas extraction system or otherwise well ventilated. The exhaust gas contains carbon monoxide, a colourless, odourless, and lethal gas.

1. Insert red key into the starter switch.

Do not turn the key at this point. If the key is in the RUN position, turn it back to the STOP position.

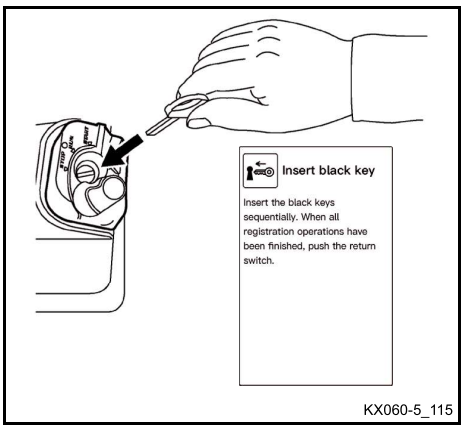
2. Press Jog dial (enter switch).

3. The display shows the "Pull out the key" message.



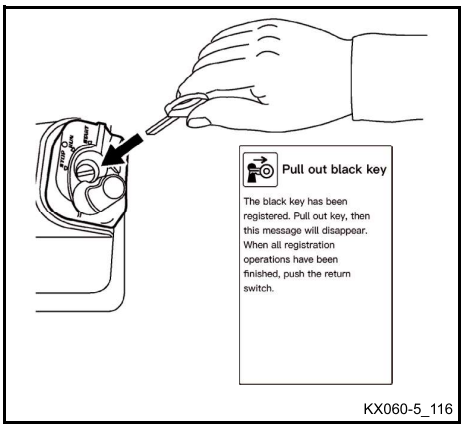
4. Pull out the red key.
5. The display shows the "Insert black key" message.
6. Insert black key into the starter switch.

Do not turn the key at this point. If the key is in the RUN position, turn it back to the STOP position.



7. After a brief moment, the display shows the "Pull out black key" message. This message indicates that the black key was registered for the given vehicle.
8. Press the return switch on dial switch to complete registration.
9. One after the other, insert all registered black keys into the starter switch and check whether the engine can be started using these keys.

If a registered black key is lost, the other black keys must be re-registered. This procedure locks the lost or stolen black key, which can no longer be used to start the engine.



TROUBLESHOOTING

The troubleshooting section includes only malfunctions and incorrect operations which must be remedied by the operator. Any other malfunctions may only be resolved by trained personnel. The troubleshooting must be performed with the aid of the troubleshooting table. In order to locate a malfunction, first look in the MALFUNCTION column for the corresponding machine malfunction. In the POSSIBLE CAUSE column you will find the possible causes for the malfunction. The REPAIR column indicates the required remedial measure. If the failure cannot be remedied by the measure indicated in the REPAIR column, please consult your KUBOTA dealer.

Safety rules for troubleshooting

Adhere to the general safety rules (page 17) and the safety rules for operation (page 73).

The operator is not allowed to open the electrical and hydraulic system. These services are reserved for trained personnel.

During troubleshooting, the safety on and around the machine must always be ensured.

If troubleshooting of the machine calls for the bucket to be raised, the operator may not stand in the area of the front attachments unless the front attachments are secured against inadvertent lowering by suitable measures.

Troubleshooting: Before operation

MALFUNCTION	POSSIBLE CAUSE	REPAIR
Start-up		
No function available when the starter switch is turned to the RUN position.	Main fuse at battery blown	Replace the main fuse (page 148).
Indicator lights do not come on as expected when the starter switch is turned to the RUN position.	Fuse blown	Replace the fuses (page 146).
Starter does not turn when the starter switch is turned to the START position.	Battery depleted	Charge the battery (page 196). Jump-starting the machine (page 142).
	Engine emergency stop	Push the engine emergency stop (page 32).
	Control lever lock not raised	Raise the control lever lock.
Engine does not start when the starter switch is turned to the START position, but starter turns.	Air in the fuel system	Check the fuel system for leaks and bleed it (page 146).
	Water in the fuel system	Check the water content of the water separator (page 87), drain if necessary (page 185).
	Fuel is too viscous or dirty	Check fuel tank and fuel filter, remove contamination and water, replace fuel filter if necessary.
Engine runs sluggishly during winter time.	Oil viscosity is too high	Warm up the radiator, e.g. pour hot water on it.

Troubleshooting: Operation

MALFUNCTION	POSSIBLE CAUSE	REPAIR
Operation		
Insufficient engine power	Air filter restricted	Check, clean and replace the air filter (page 182).
	Fuel filter contaminated or water in fuel system	Check the water content of the water separator (page 87), drain if necessary (page 185).
No pilot-controlled hydraulic functions available.	Fuse in fuse box blown	Replace the fuses (page 146).
Power of hydraulic functions is too low or disruptive.	Hydraulic oil level too low	Check the hydraulic oil level, add hydraulic oil (page 193).
	Suction filter restricted	Change the suction filter in the hydraulic oil tank (page 191).
Travel speed button does not work.	Fuse in fuse box blown	Replace the fuses (page 146).
Heater fan, wiper/washer system, interior light, horn, working light not operating.	Fuse in fuse box blown	Replace the fuses (page 146).
Indicator for the AUTO IDLE switch lights up.	Fuse in fuse box blown	Replace the fuses (page 146).
Exhaust gas colour very black.	Fuel quality is low	Use fuel according to EN 590 or ASTM D975.
	Engine oil level is too high	Check engine oil level, drain engine oil down to specified level if necessary.
	Air filter restricted	Check, clean and replace the air filter (page 182).

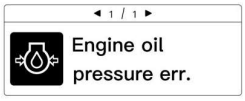
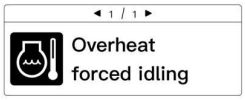
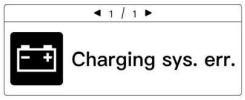
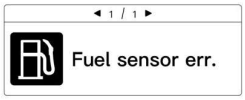
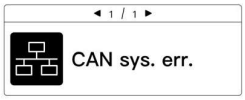
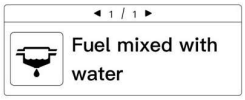
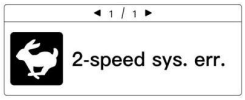
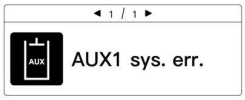
MALFUNCTION	POSSIBLE CAUSE	REPAIR
Operation		
The engine stops suddenly.	Fuel shortage	Check the fuel level; refuel and bleed if necessary.
	Fuel filter clogged	Replace the fuel filter if necessary.
Coolant temperature is too high.	Water pump seal is damaged	Replace it; consult your KUBOTA dealer if necessary.
	V-belt is damaged or very loose	Replace and/or tension it (page 177).
	Thermo switch is malfunctioning	Replace it; consult your KUBOTA dealer if necessary.
	Coolant level too low	Refill coolant (page 175).
	Leaky cooling system components	Check the cooling system for leaks, see the "Changing the Coolant" section (page 179).
	Dirty radiator and/or condenser	Clean the radiator and condenser (page 176).
	Cylinder head seal is damaged	Replace it; consult your KUBOTA dealer if necessary.
	Engine oil level is too low	Check the engine oil level, add engine oil if necessary (page 181).
	Fuel quality is low	Use fuel according to EN 590 or ASTM D975.
Deviation in driving direction of machine.	Crawler tension adjusted incorrectly	Check and adjust the crawler tension, if necessary (page 200).
	Blocked by stones	Remove the stones.

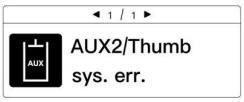
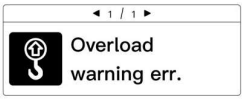
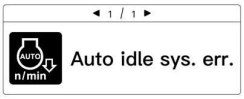
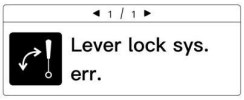
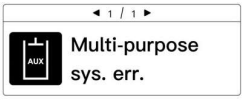
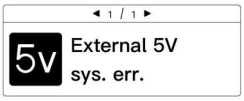
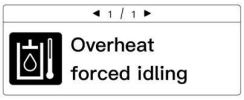
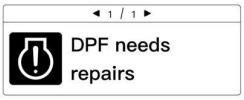
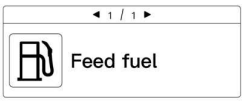
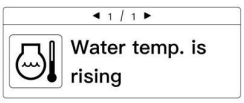
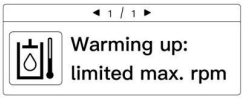
Troubleshooting: Display indications

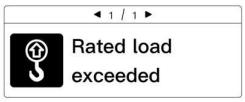
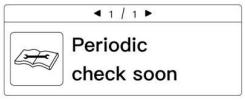
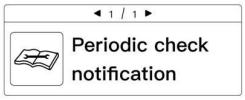
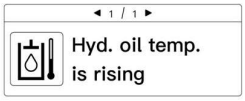
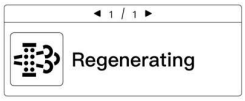
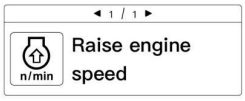
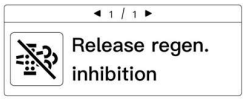
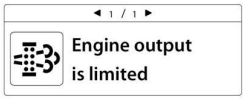
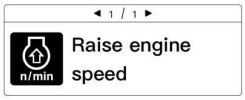
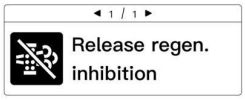
If the machine develops a fault, one of the following messages will appear on the display. In the event of problems. please inform your KUBOTA dealer immediately.

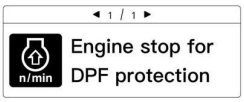
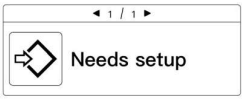
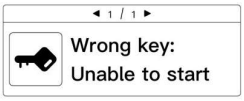
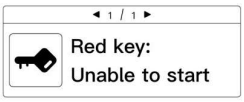
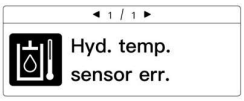
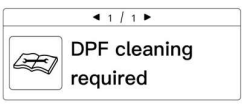
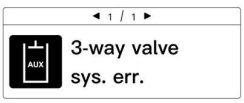
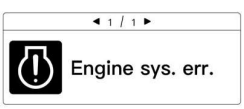
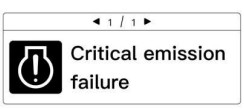
It is essential to take prompt action to rectify any incorrect operation, use or maintenance of the emission control system in accordance with rectification as specified in the solution column.

You can view detailed information by pressing the Jog dial (enter switch). Inform your KUBOTA dealer which messages appeared in the display.

No.	indicator	Problem/Error	Preliminary Measure	Solution
1.		Engine oil pressure is too low. Engine may burn out.	Stop the engine immediately. The engine may have developed a fault.	Inform your KUBOTA dealer immediately.
2.		Coolant temp. is too high. Engine will automatically reduce engine speed for cooling.	Allow the machine to cool off by idling. Do not switch the engine off as the coolant could then boil over.	Clean the radiator and check the coolant, top up if necessary. Check the hydraulic system for leaks; if necessary, contact your KUBOTA dealer.
3.		Problem with charging system. The machine will work until the battery dies.	Check the V-belt. When the V-belt is OK, let the engine run until indicator goes out.	If the indicator does not turn off, immediately inform your KUBOTA dealer.
4.		Fuel sensor system is in trouble. Fuel level indicator doesn't appear on meter.	-	Inform your KUBOTA dealer immediately.
5.		Problem with communication (CAN) system. Some meter readings may be erroneous or some switches may malfunction.	The machine can be started and driven. Do not perform any work with the machine.	Inform your KUBOTA dealer immediately.
6.		Fuel was mixed with water. There is a risk of serious engine damage.	Immediately drain the water from fuel system after stopping engine. Risk of damage to the engine.	Check and separate water from the fuel filter and clean the water separator. If the indicator lights up again, immediately contact your KUBOTA dealer.
7.		Problem with 2-speed system.	The machine will still run at low speed but will not switch to high speed.	Inform your KUBOTA dealer immediately.
8.		Problem with AUX1 system.	If systems other than AUX1 system function, work can be continued.	Inform your KUBOTA dealer immediately.

No.	indicator	Problem/Error	Preliminary Measure	Solution
9.		Problem with AUX2 / Thumb system.	If systems other than AUX2 / Thumb system function, work can be continued.	Inform your KUBOTA dealer immediately.
10.		Charging voltage is too high. There may be a problem with the electric device.	Switch the engine off immediately and check the battery and the alternator. Restart the engine.	If the indicator lights up again after restarting, immediately contact your KUBOTA dealer.
11.		Problem with overload warning system.	If systems other than overload warning system function, work can be continued.	Inform your KUBOTA dealer immediately.
12.		Auto idle system and accelerator have failed.	Accelerator will not function, but other functions are still operational.	Inform your KUBOTA dealer immediately.
13.		Problem with lever lock system.	Engine can run, but machine fails to move.	Inform your KUBOTA dealer immediately.
14.		Problem with multi-purpose system.	If systems other than multi-purpose system function, work can be continued.	Inform your KUBOTA dealer immediately.
15.		Sensor's 5V power supply has short-circuited.	Majority of systems have failed.	Inform your KUBOTA dealer immediately.
16.		Hyd. oil temperature is too high. Engine will automatically reduce engine speed for cooling.	Do not stop engine until the hydraulic oil cool down.	Clean the oil cooler and check the hydraulic oil, top up if necessary. Check the hydraulic system for leaks; if necessary, contact your KUBOTA dealer.
17.		DPF is clogged. DPF must be repaired.	-	Inform your KUBOTA dealer immediately.
18.		DPF must be replaced.	-	Inform your KUBOTA dealer immediately.
19.		Fuel is running out.	-	Refuel the machine.
20.		Water temperature is rising somewhat higher than specified.	Check the radiator and other components for clogs. Immediately clean them.	-
21.		Hyd. oil temp. is too low. Engine is revved up only to the medium rpm for warming-up.	-	-

No.	indicator	Problem/Error	Preliminary Measure	Solution
22.		Load to be lifted is too heavy.	The overload warning applies only to lifting loads. Deactivate the overload warning during other types of work (e.g. excavating) by pressing the overload warning switch.	Lower load and reduce its weight.
23.		10 hours until periodic check interval.	Operate the machine as usual.	Ask your KUBOTA dealer for relevant parts and use them to replace existing parts.
24.		Periodic check interval has passed.	The machine can be operated but service must be carried out urgently.	Ask your KUBOTA dealer for relevant parts and use them to replace existing parts.
25.		Hyd. oil temp. is rising somewhat higher than specified.	Check the oil cooler and other components for clogs. Immediately clean them.	-
26.		DPF is regenerating. This is a normal maintenance activity. Exhaust temp. is rising. It is possible to work with careful operation.	-	-
27.		DPF must be regenerated.	-	Raise engine speed and start the particle filter regeneration. If the indicator lights up again, immediately contact your KUBOTA dealer.
28.		DPF must be regenerated.	-	Drive the machine to a safe place and release the particle filter regeneration. If the indicator lights up again, immediately contact your KUBOTA dealer.
29.		DPF is regenerating. Engine output is limited to prevent engine problems.	-	Keep raising engine speed and finish DPF regen. process.
30.		DPF must be regenerated immediately. Engine output is limited to prevent engine problems.	-	Raise engine speed and start the particle filter regeneration. If the indicator lights up again, immediately contact your KUBOTA dealer.
31.		DPF must be regenerated immediately. Engine output is limited to prevent engine problems.	-	Drive the machine to a safe place and release the particle filter regeneration. If the indicator lights up again, immediately contact your KUBOTA dealer.

No.	indicator	Problem/Error	Preliminary Measure	Solution
32.		Engine was stopped automatically to protect DPF.	-	After turning off and restarting engine, rev up engine to start DPF regen.
33.		Setup is required. Functions may not work.	-	Inform your KUBOTA dealer.
34.		Engine cannot be started.	-	Press the engine stop button before starting engine.
35.		Key is incorrect. Engine will not start.	-	Start engine with correct key.
36.		Cannot start with red key. Engine will not start.	-	Start engine with correct key.
37.		Problem with hyd. oil temp. sensor system.	Meter does not show hyd. oil temp., and overheating cannot be detected.	Inform your KUBOTA dealer immediately.
38.		DPF will need cleaning soon.	Operate the machine as usual.	Contact your KUBOTA dealer to clean DPF.
39.		DPF needs cleaning.	-	Contact your KUBOTA dealer to clean DPF.
40.		Engine is preheating.	-	Wait until this message disappears, and then start engine.
41.		There is a risk of serious injury or death.	-	Fasten seatbelt.
42.		Problem with 3-way valve system.	If systems other than 3-way valve system function, work can be continued.	Inform your KUBOTA dealer immediately.
43.		Malfunctions in the Common Rail System.	-	Inform your KUBOTA dealer immediately.
44.		Malfunctions in the particulate control device (PCD) / NOx control device (NCD).	Engine control is not working properly.	Immediately contact your KUBOTA dealer of the emergency repair.

MAINTENANCE

The maintenance section includes all care and maintenance tasks to be performed on the machine.

Careful maintenance of the machine will guarantee functional safety and a longer service life.

Failure to perform the servicing will void the warranty and any liability by KUBOTA.

Only use spare parts that are recommended by the manufacturer. Non-approved spare parts of inferior quality or wrong classification result in an increased risk of accidents. Operators using non-approved spare parts are fully responsible for any damage arising as a consequence.

Safety rules for maintenance

- The operator must provide persons who work with or on the machine with suitable personal protective equipment (PPE) and those persons must use that equipment where applicable, for example: suitable working clothes, safety shoes, safety helmets, eye protection, ear protection and breathing masks. The owner/employer bears the main responsibility for the PPE, which is specified by the safety rules for particular types of activity.
- Maintenance, cleaning and care activities may only be carried out if the machine is fully shut down. The machine must be secured against restarting by removing the ignition key.
- The bucket must always be lowered to the ground for servicing.
- When malfunctions are detected during servicing or maintenance, the machine may only be operated after the malfunctions have been remedied. Repairs may only be carried out by trained personnel.
- When carrying out maintenance and care activities, always make sure that the machine is secured and stable.
- When working on the fuel system, smoking, open flames and the operation of other ignition sources are not allowed. The danger zone has to be clearly marked with signs. A fire extinguisher must be kept at hand in the danger zone.
- All waste materials must be discarded in accordance with environmental protection regulations.
- Use the maintenance and care materials listed in the "Operating materials" section (page 210).
- When working on the electrical system, disconnect it from the voltage source before starting the work. The work may only be carried out by technicians with electrical training.
- Always use a ladder or a scaffold if the work cannot be reached by the operator.
- The controls may only be used while the operator is sitting on the operator's seat.

Personnel requirements

- The operator may only carry out cleaning and care activities.
- The servicing may only be performed by trained personnel.

Repair work on the machine

Repairs on the machine may only be carried out by trained personnel.

If repairs are carried out on load-bearing parts, for example welding on frame parts, the work has to be checked by a qualified person.

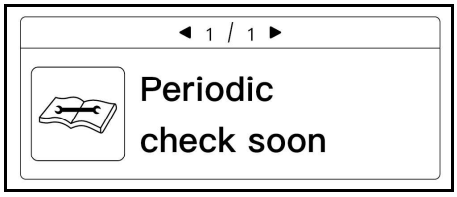
After repairs, the machine should be operated only if it is functioning properly. For this check, particular attention must be paid to the repaired parts and the safety devices.

Maintenance intervals

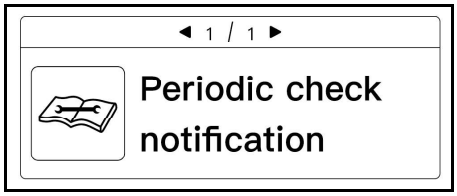
Maintenance interval display

10 hours before a certain service interval is due, the respective maintenance interval is already indicated on the display.

The adjacent figure shows the “Periodic check soon” message.



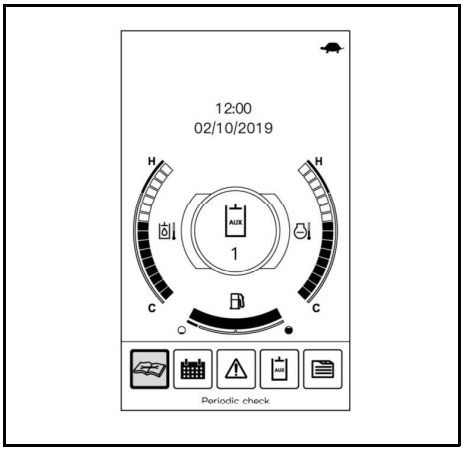
Once the time for a service interval has been reached or exceeded, the “Periodic check notification” message appears on the display.



- Press menu switch on dial switch.

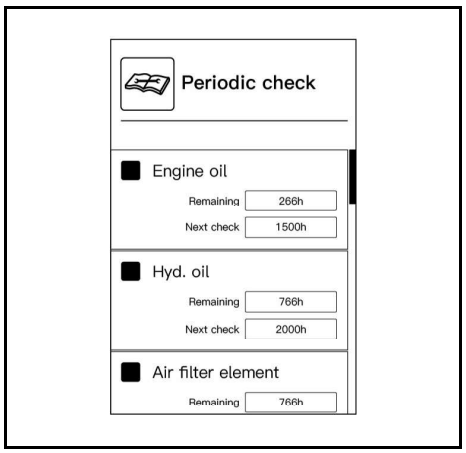
The menu bar appears in the display.

- Rotate the jog dial to the right, until “Periodic check” is selected in the display.
- Press Jog dial (enter switch).



The list of “Periodic check” check points appears in the display.

- To rotate jog dial can be used to scroll up and down through the list of maintenance points.



The maintenance points illustrated in the following table are set in the service period indicator.

No.	Maintenance point		Task	Elapsed hours of operation*										Interval
				50	100	250	500	600	750	1000	1500	2000	3000	
1	Engine oil		Change				❍			❍	❍	❍	❍	500 h
2	Fuel filter		Change				❍			❍	❍	❍	❍	500 h
3	Engine oil filter		Change				❍			❍	❍	❍	❍	500 h
4	Drive unit oil	initial	Change	●										50 h
			Change				❍			❍	❍	❍	❍	500 h
5	Return filter	initial	Change			●								250 h
			Change				❍			❍		❍	❍	500 h
6	Hydraulic oil		Change							❍		❍	❍	1000 h
7	Air filter element		Change							❍		❍	❍	1000 h
8	Suction filter		Change							❍		❍	❍	1000 h
9	Pilot circuit filter		Change							❍		❍	❍	1000 h
10	Oil separator element		Change								❍			1500 h
11	Oil in idler and track roller		Change									❍		2000 h

* The maintenance tasks denoted with ● must be carried out once the specified hours of operation after initial commissioning have been reached.

The machine’s engine features an exhaust purification system. The engine must be operated, used and serviced according to the following provisions in order to maintain the emission performance.

- *Only use the fuel recommended in these operating instructions.*
- *Only use the engine oil recommended in these operating instructions.*
- *Service the engine according to the intervals recommended in these operating instructions.*
- *Replace the engine-related components according to the intervals recommended in these operating instructions.*

General maintenance chart: 50 to 500 hours of operation

Operator servicing

Servicing		Tasks	Elapsed hours of operation										Interval	Page
			50	100	150	200	250	300	350	400	450	500		
Walk-around inspection		Check											Daily	83
Dust valve		Clean											Daily	84
Engine oil level		Check											Daily	84
Coolant level		Check											Daily	84
Coolant radiator and oil cooler (A/C condenser)		Check											Daily	85
		Clean				❍				❍			200 h	176
V-belt		Check											Daily	85
Exhaust system leakage		Check											Daily	86
Hydraulic oil level		Check											Daily	86
Water separator		Check											Daily	87
		Clean	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	187
Bucket bolt and bucket linkage bolt		Grease											Daily	87
Fuel level		Check											Daily	88
Fluid level of the wiper/washer system (cab version)		Check											Daily	88
Electrical equipment		Check											Daily	87
Fuel tank		Drain	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	189
Battery		Check	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	195
Swivel gear		Grease	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	197
Crawler tension		Check	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	200
		Adjust	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	202
Lubricate the front-end attachments	Swing bracket	Grease		❍		❍		❍		❍		❍	100 h	198
	Other greasing points	Grease					❍					❍	250 h	199
Interior air filter (cab version) 1.) 2.)		Clean			❍			❍			❍		150 h	183
Swivel bearing		Grease				❍				❍			200 h	198
Air filter element 1.)		Clean				❍				❍			200 h	182
Fuel lines and air intake hoses		Check				❍				❍			200 h	189

1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
2.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

General maintenance chart: 550 to 1000 hours of operation

Operator servicing

Servicing		Tasks	Elapsed hours of operation										Interval	Page
			550	600	650	700	750	800	850	900	950	1000		
Walk-around inspection		Check											Daily	83
Dust valve		Clean											Daily	84
Engine oil level		Check											Daily	84
Coolant level		Check											Daily	84
Coolant radiator and oil cooler (A/C condenser)		Check											Daily	85
		Clean		❍				❍				❍	200 h	176
V-belt		Check											Daily	85
Exhaust system leakage		Check											Daily	86
Hydraulic oil level		Check											Daily	86
Water separator		Check											Daily	87
		Clean	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	187
Bucket bolt and bucket linkage bolt		Grease											Daily	87
Fuel level		Check											Daily	88
Fluid level of the wiper/washer system (cab version)		Check											Daily	88
Electrical equipment		Check											Daily	87
Fuel tank		Drain	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	189
Battery		Check	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	195
Swivel gear		Grease	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	197
Crawler tension		Check	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	200
		Adjust	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	50 h	202
Lubricate the front-end attachments	Swing bracket	Grease		❍		❍		❍		❍		❍	100 h	198
	Other greasing points	Grease					❍					❍	250 h	199
Interior air filter (cab version) 1.) 2.)		Clean		❍			❍			❍			150 h	183
Swivel bearing		Grease		❍				❍				❍	200 h	198
Air filter element 1.)		Clean		❍				❍				❍	200 h	182
Fuel lines and air intake hoses		Check		❍				❍				❍	200 h	189

1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
2.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Servicing maintenance chart: 50 to 500 hours of operation

Servicing by skilled personnel or KUBOTA dealer

Servicing	Tasks	Elapsed hours of operation*										Interval	Page
		50	100	150	200	250	300	350	400	450	500		
V-belt	Adjust					❍					❍	250 h	177
Pilot valve linkage	Grease					❍					❍	250 h	175
Coolant hoses and hose clamps	Check					❍					❍	250 h	179
	Change	Please contact your KUBOTA dealer.										Every 2 years	179
Water separator filter	Change										❍	500 h	188
Engine oil and oil filter	Change										❍	500 h	180
Drive unit oil 2.) initial	Change	●										50 h	203
Drive unit oil 2.)	Change										❍	500 h	203
Fuel filter	Change										❍	500 h	184
Return filter 5.) initial	Change					●						250 h	190
Return filter 5.)	Change										❍	500 h	190
Interior air filter (cab version) 1.) 7.)	Change										❍	500 h	183
In-line filter	Change											1000 h	204
Hydraulic oil and suction filter 4.)	Change											1000 h	191
Pilot circuit filter	Change											1000 h	190
Air filter element 1.)	Change											1000 h	182
Engine valve clearance	Check	Please contact your KUBOTA dealer.										1000 h	--
Fuel injector nozzle tip	Check	Please contact your KUBOTA dealer.										1500 h	--
Oil separator element	Change	Please contact your KUBOTA dealer.										1500 h	--
EGR cooler	Check	Please contact your KUBOTA dealer.										1500 h	--
Fuel tank breather filter	Change	Please contact your KUBOTA dealer.										2000 h	--
Oil in idler and track roller	Change	Please contact your KUBOTA dealer.										2000 h	--
Alternator and starter motor	Check	Please contact your KUBOTA dealer.										2000 h	--
EGR system	Check	Please contact your KUBOTA dealer.										3000 h	--
Turbocharger	Check	Please contact your KUBOTA dealer.										3000 h	--
EGR and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
Electric lines and connections	Check											Annually	204
Safety inspection 3.)	Check											Annually	213
Boost sensor and air flow sensor	Check	Please contact your KUBOTA dealer.										Annually	--
DPF (Diesel particulate filter) 6.)	Check	Please contact your KUBOTA dealer.										Annually	--
DPF (Diesel particulate filter) 6.)	Clean	Please contact your KUBOTA dealer.										6000 h	--
Pipes and hoses of the air conditioner	Check											Annually	203
Pipes and hoses of the air conditioner	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Refrigerant content	Check											Annually	205
Oil separator rubber hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
EGR cooler hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
DPF differential pressure sensor hoses (front and rear)	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Rubber hoses of the intake air line	Change	Please contact your KUBOTA dealer.										Every 2 years	--

Servicing	Tasks	Elapsed hours of operation*										Interval	Page
		50	100	150	200	250	300	350	400	450	500		
Fuel lines	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Hydraulic hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant	Change											Every 2 years	179

* The servicing identified with ● must be carried out once the specified hours of operation after initial operation have been reached.

1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
2.) Earlier if necessary.
3.) At least annually.
4.) When using a breaker over 20% → every 800 h.
When using a breaker over 40% → every 400 h.
When using a breaker over 60% → every 300 h.
When using a breaker over 80% → every 200 h.
5.) When using a breaker over 20% → every 200 h.
When using a breaker over 60% → every 100 h.
6.) The machine features a warning system for the DPF cleaning.
The diesel particle filter should be cleaned in the event of a warning or every 6000 operating hours.
7.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Servicing maintenance chart: 550 to 1000 hours of operation

Servicing by skilled personnel or KUBOTA dealer

Servicing	Tasks	Elapsed hours of operation										Interval	Page
		550	600	650	700	750	800	850	900	950	1000		
V-belt	Adjust					❍					❍	250 h	177
Pilot valve linkage	Grease					❍					❍	250 h	175
Coolant hoses and hose clamps	Check					❍					❍	250 h	179
	Change	Please contact your KUBOTA dealer.										Every 2 years	179
Water separator filter	Change										❍	500 h	188
Engine oil and oil filter	Change										❍	500 h	180
Drive unit oil 2.) initial	Change											50 h	203
Drive unit oil 2.)	Change										❍	500 h	203
Fuel filter	Change										❍	500 h	184
Return filter 5.) initial	Change											250 h	190
Return filter 5.)	Change										❍	500 h	190
Interior air filter (cab version) 1.) 7.)	Change										❍	500 h	183
In-line filter	Change										❍	1000 h	204
Hydraulic oil and suction filter 4.)	Change										❍	1000 h	191
Pilot circuit filter	Change										❍	1000 h	190
Air filter element 1.)	Change										❍	1000 h	182
Engine valve clearance	Check	Please contact your KUBOTA dealer.										1000 h	--
Fuel injector nozzle tip	Check	Please contact your KUBOTA dealer.										1500 h	--
Oil separator element	Change	Please contact your KUBOTA dealer.										1500 h	--
EGR cooler	Check	Please contact your KUBOTA dealer.										1500 h	--
Fuel tank breather filter	Change	Please contact your KUBOTA dealer.										2000 h	--
Oil in idler and track roller	Change	Please contact your KUBOTA dealer.										2000 h	--
Alternator and starter motor	Check	Please contact your KUBOTA dealer.										2000 h	--
EGR system	Check	Please contact your KUBOTA dealer.										3000 h	--
Turbocharger	Check	Please contact your KUBOTA dealer.										3000 h	--
EGR and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
Electric lines and connections	Check											Annually	204
Safety inspection 3.)	Check											Annually	213
Boost sensor and air flow sensor	Check	Please contact your KUBOTA dealer.										Annually	--
DPF (Diesel particulate filter) 6.)	Check	Please contact your KUBOTA dealer.										Annually	--
	Clean	Please contact your KUBOTA dealer.										6000 h	--
Pipes and hoses of the air conditioner	Check											Annually	203
	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Refrigerant content	Check											Annually	205
Oil separator rubber hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
EGR cooler hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
DPF differential pressure sensor hoses (front and rear)	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Rubber hoses of the intake air line	Change	Please contact your KUBOTA dealer.										Every 2 years	--

Servicing	Tasks	Elapsed hours of operation										Interval	Page
		550	600	650	700	750	800	850	900	950	1000		
Fuel lines	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Hydraulic hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant	Change											Every 2 years	179

1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
2.) Earlier if necessary.
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4.) When using a breaker over 20% → every 800 h.
When using a breaker over 40% → every 400 h.
When using a breaker over 60% → every 300 h.
When using a breaker over 80% → every 200 h.
5.) When using a breaker over 20% → every 200 h.
When using a breaker over 60% → every 100 h.
6.) The machine features a warning system for the DPF cleaning.
The diesel particle filter should be cleaned in the event of a warning or every 6000 operating hours.
7.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Cleaning the machine

Before cleaning, shut down the engine and secure it against starting.

If a steam cleaner is used for cleaning the machine, do not direct the steam jet at electric components.

Do not direct a water jet into the intake opening of the air filter.

Do not clean the machine with inflammable liquids.

The machine may only be washed at suitable places (using oil and grease separators).

The machine can be cleaned with water and a commercial cleaning agent. Make sure no water gets into the electrical system.

Before cleaning, make sure to tape the air inlet for the air-conditioner and heater system at the swivel frame.

Cleaning of plastic parts or synthetic leather

Cleaning the plastic parts with alkaline, acidic, or organic solvents such as alcohol or benzene can damage them.

- *Use a soft cloth when wiping plastic parts or synthetic leather.*

If the plastic or synthetic leather is very dirty:

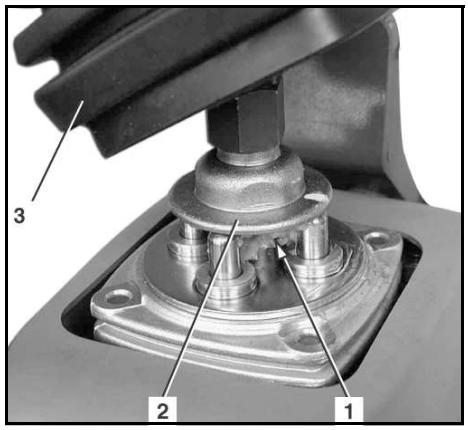
- Dilute a mild detergent with water, dip a soft cloth in the diluted detergent and wipe off the dirt.
- To dry, moisten a soft cloth with clean water and wring out thoroughly. Wipe off any remaining moisture or detergent residue with the cloth.

Servicing

Adhere to the instructions for regular servicing to keep the machine in good condition.

Pilot valve linkage - grease

- Pull rubber boot (3) on the control lever upward.
- Lubricate the linkage (1) underneath the disc (2) with grease. See "Operating materials" section (page 210).
- Insert the bellows into the console.
- Perform the same service on the second control lever.

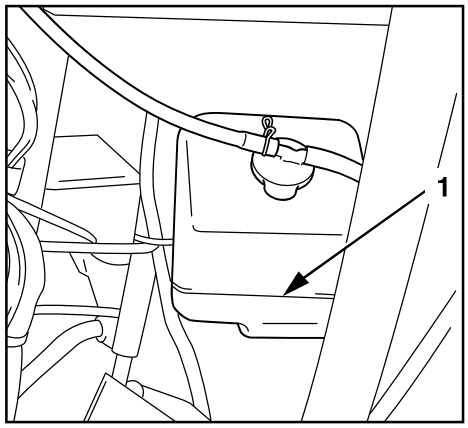


Coolant - refill

- Open the side cover (page 150).
- Check the antifreeze content with an antifreeze tester that is qualified for -25 °C.

The antifreeze portion of the coolant should not exceed 50%.

- Open the coolant expansion reservoir cap when the engine is cool and fill pre-mixed coolant up to the FULL mark (1).
- Close the expansion tank cover.

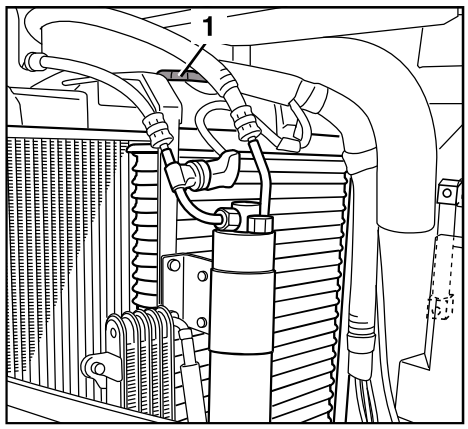


If the coolant expansion reservoir was completely empty, check the coolant level in the radiator.

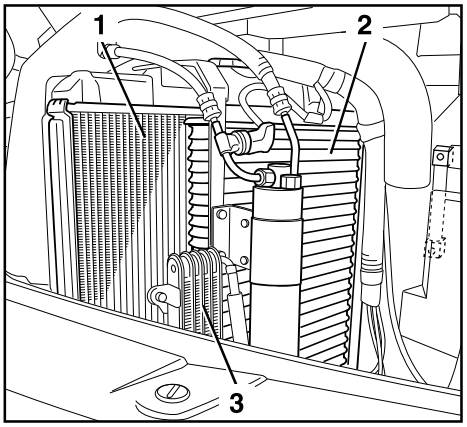
STOP

Do not open the radiator cap while the engine is still hot, risk of scalding.

- Remove the radiator cap (1) by turning it anticlockwise.
- The coolant level should be at the lower mark of the filler plug; if not, add coolant.
- Close the radiator cap.
- Close the side cover.



Radiator - clean



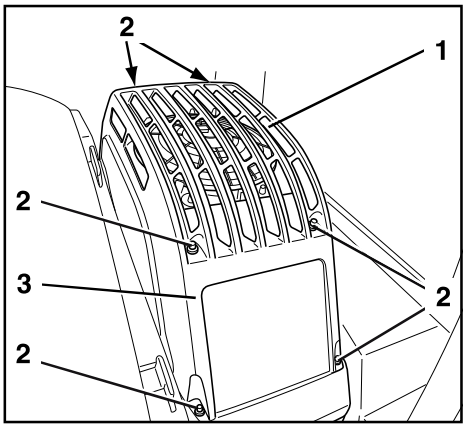
Do not touch the hot radiators: risk of burning.

- Open the side cover (page 150).
- Clean the coolant radiator (1), hydraulic oil radiator (2), and fuel cooler (3) from the engine side with a water jet or a compressed air pistol. Do not use high-pressure cleaners.
- Particular care must be devoted to the space between the radiators, because foliage often collects at this point.

After cleaning, inspect the radiators for damage.

- Close the side cover.

Condenser - clean



Do not touch the hot condenser: risk of burning.

- Remove six screws (2).
- Remove the protection cover (3).
- Clean the condenser (1) with a water jet or a compressed air pistol. Do not use high-pressure cleaners.
- Particular care must be devoted to the space around the condenser, because foliage often collects at this point.

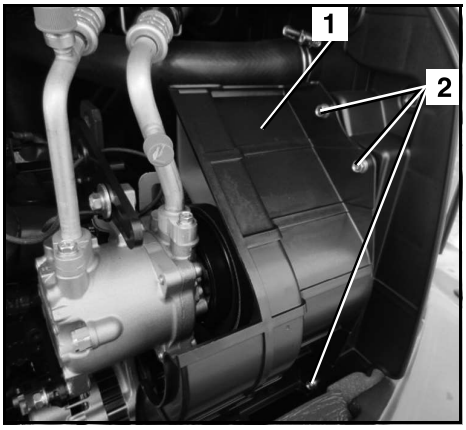
After cleaning, inspect the condenser for damage.

- Install the protection cover.
- Refit the screws.

V-belts - check/adjust/change

Removing and Installing the V-belt cover

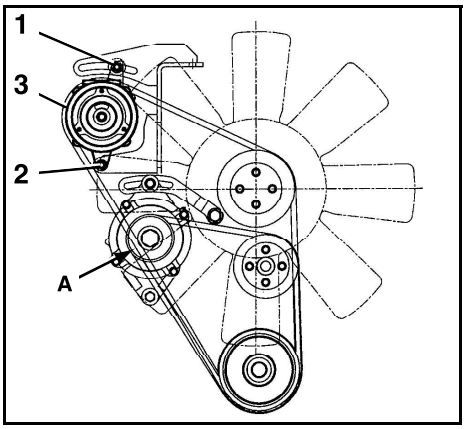
Risk of injury by rotating components!
The V-belt cover must be removed before performing any work with the V-belt. If the engine is running during these works, there is a risk of being caught and injured by rotating components. Make sure to turn off the engine and to remove the key before performing any works in the engine compartment.



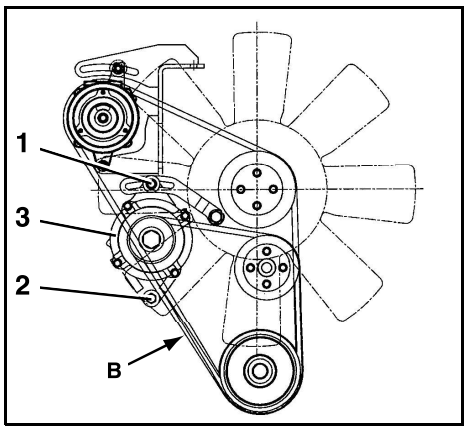
- Open the engine compartment cover (page 149).
- To remove the V-belt cover, (1) loosen three bolts (2) and detach the V-belt cover.
- Lay aside the bolts and the V-belt cover and then perform the works.
- After finishing the work, install the V-belt cover and secure with three bolts. Tighten to 3~5 Nm.
- Make sure the V-belt cover is bolted in the correct position.
- Close the engine compartment cover.

Adjusting the V-belts

- Remove the V-belt cover.
- Check the V-belt (page 85).
- Remove the mounting screws (1 & 2).
- Tension the V-belt by swinging the compressor (3).
- Press in the V-belt at position "A". The V-belt must give way for approx. 12 to 15 mm (pressure: 7 kg).
- Tighten the fastening screws.
- After adjusting, check the V-belt.

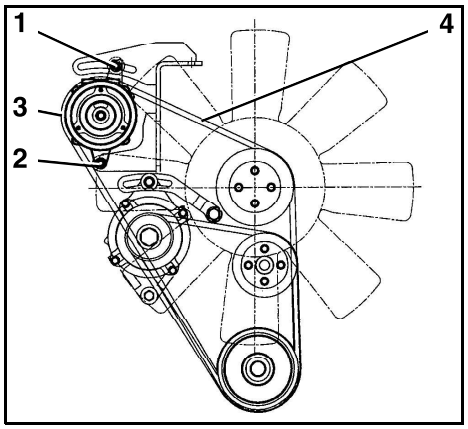


- Remove the mounting screws (1 & 2).
- Tighten the V-belt by swinging the alternator (3).
- Press in the V-belt at position "B". The V-belt must give way for approx. 10 mm (pressure: 10 kg).
- Tighten the fastening screws.
- After adjusting, check the V-belt.
- Install the V-belt cover.

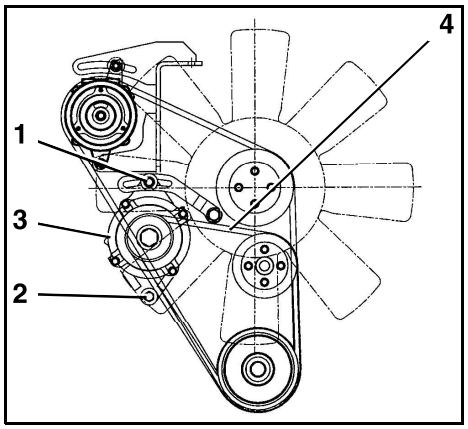


Replacing the V-belts

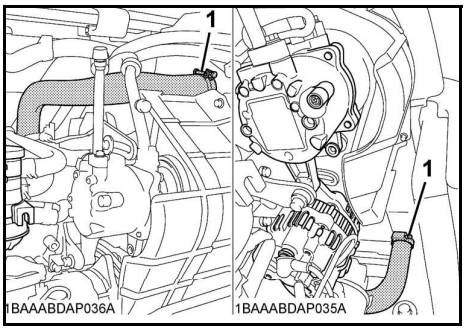
- Remove the V-belt cover.
- Remove the mounting screws (1 & 2).
- Swing the compressor (3) and remove the V-belt (4).
- Install a new V-belt.
- Adjust the V-belt.



- Remove the mounting screws (1 & 2).
- Swing the alternator (3) and remove the V-belt (4).
- Install a new V-belt.
- Adjust and check the V-belt.
- Install the V-belt cover.



Coolant hoses and hose clamps - check



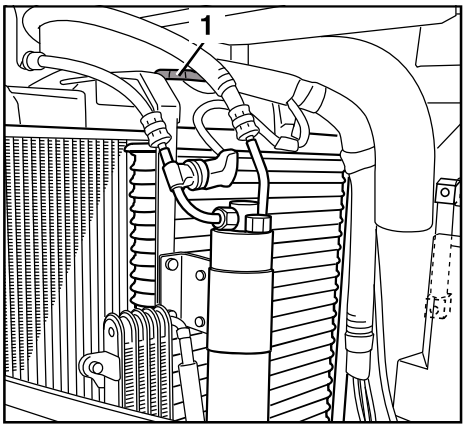
Only carry out inspections when engine is cold, otherwise there is a risk of burns!

- Open the engine compartment cover (page 149).
- Open the side cover (page 150).

Inspect the condition of all hose connections (1) on the engine and to the radiator or to the heater fan (cracks, bulges, hard spots), check for leaks and verify tightness of the clamps. If necessary, have the hoses replaced by trained personnel.

- Close the side cover.
- Close the engine compartment cover.

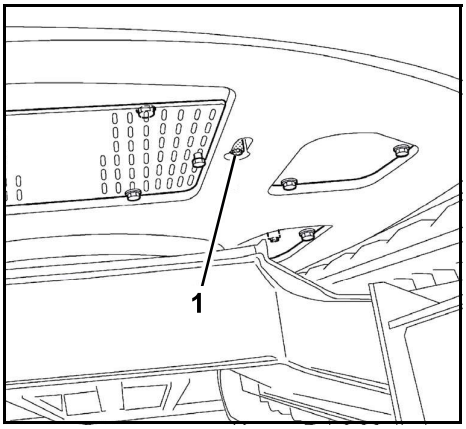
Coolant - change



Drain the coolant only when the engine is cold.

Total cooling system capacity: 11.8 l

- Open the engine compartment cover and the side cover (page 149 and page 150).
- Remove the radiator cap (1) by turning it anticlockwise.



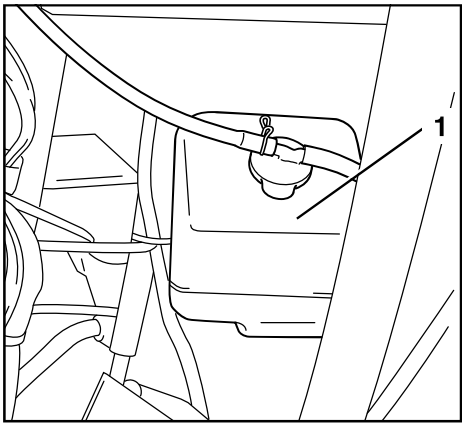
- Open the central coolant drain plug (1) and drain the coolant completely.

Fill the coolant in a container and dispose of it in accordance with the prevailing environmental protection regulations.

Flush out the cooling system if the coolant is very dirty. To do this, spray water without additives into the cooling system with a hose through the filler opening until clear water emerges from the outlet.

- Close the central drain.

- Remove the coolant expansion reservoir (1) and drain it, cleaning it if necessary. Refit the reservoir.
- Fill the premixed coolant into the radiator and expansion reservoir.



Do not operate the cooling system with pure water (even in summer). The antifreeze also contains a corrosion inhibitor.

- Start the engine (page 94) and let it idle to warm up.
- Stop the engine (page 97).
- Check the coolant level (page 84), top up if necessary (page 175).
- Close the engine compartment and side cover.

Engine oil and oil filter - change

- Open the engine compartment cover (page 149).

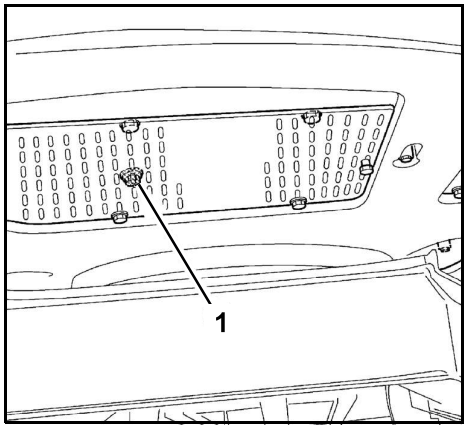
The engine oil change must be carried out while the engine is warm.

Caution: the engine oil and the oil filter are very hot → Risk of scalding.

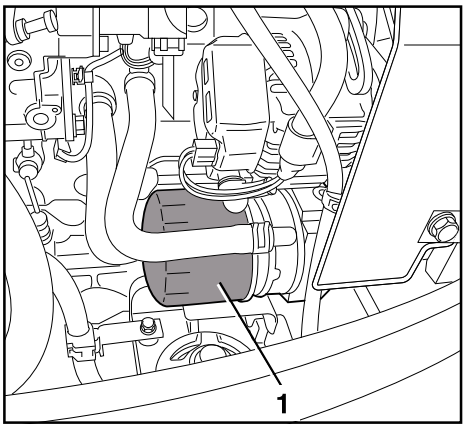
Place an oil pan with a capacity of approx. 15 litres under the engine oil drain. The engine oil should not be allowed to seep into the soil and it must be discarded like the oil filter in accordance with the applicable environmental protection regulations.

Engine oil - drain

- Remove the oil drain plug (1) and let the engine oil drain into the drain pan.
- Install the oil drain plug using a new seal.



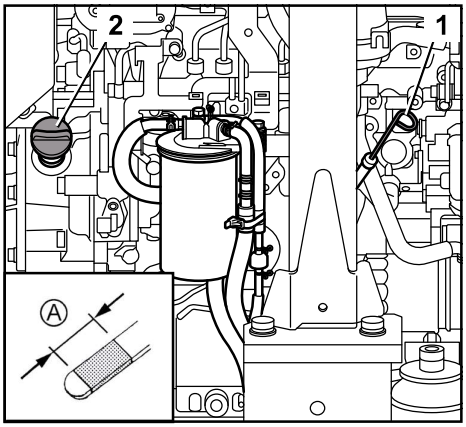
Oil filter - change



- Place an oil pan under the oil filter (1). Remove the oil filter using a filter wrench (turn anticlockwise).
- Coat the sealing ring of the new oil filter with engine oil.
- Install and tighten the oil filter by hand. Do not use the filter wrench.

Engine oil - fill

Filling capacity: 9.0 l



- Remove the oil filler cap (2) and fill with engine oil. See the “Operating materials” section (page 210).
- Screw in the oil filler cap.
- Start the engine (page 94). The engine oil pressure indicator must go out as soon as the engine is started. If this does not happen, switch the engine off immediately and contact trained personnel.
- Let the engine idle to warm up and then stop it (page 97). Check the oil level after 5 minutes.
- Pull out the oil dipstick (1) and wipe it with a clean cloth.
- Insert the oil dipstick completely and pull it out again. The oil level should be in the "A" area. If the oil level is too low, add engine oil.

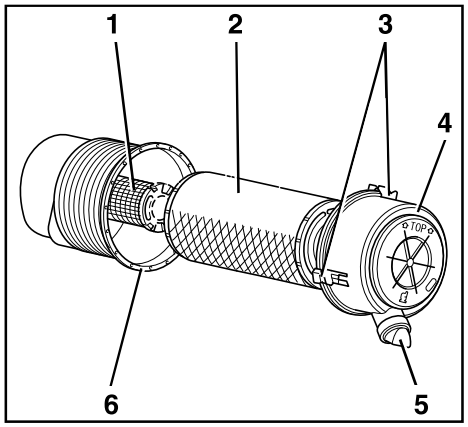
If the oil level is too high or too low, the engine might become damaged during operation.

- When changing the engine oil, fill engine oil up to the MAX mark.
- Close the engine compartment cover.

Air filter element - check/clean/change

Risk of engine damage!
The interior filter element (1) must remain installed while cleaning the air filter case (6). Otherwise, particles of dirt could enter the air intake duct while cleaning and damage parts of the injection system and engine.

- Open the engine compartment cover (page 149).
- Open the clips (3) and remove the cover (4).
- Pull the outer filter element (2) out of the air filter case (6) and check it for dirt.
- Clean the air filter case and cover without removing the inner filter element (1). Remove the inner filter element only when replacing it.
- Clean the dust valve (5).
- Replace the outer filter element if it is damaged or too much dust has accumulated on it.



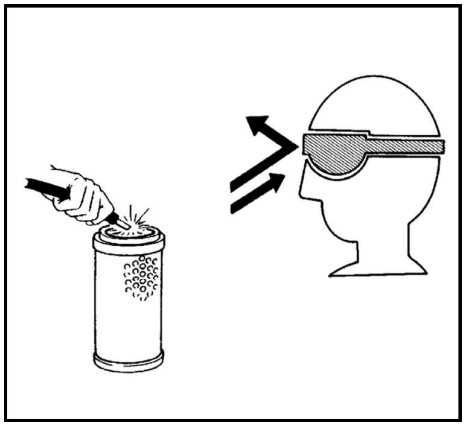
The internal filter element must only be replaced by skilled personnel in the framework of the corresponding service period.

- For the replacement, pull the internal filter element out and immediately insert a new filter element.

Do not clean the filter element with fluids. Never operate the engine without the air filter elements.

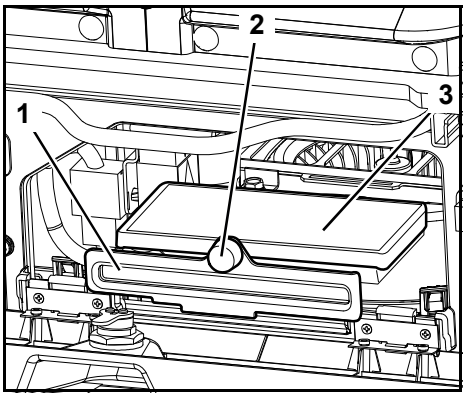
Always wear eye protection when working with compressed air.

- Clean the outer filter element with compressed air (max. 5 bar) from the inside out without damaging the filter element. Wear eye protection for this service.
- Insert the outer air filter element and the cover with the TOP mark facing up. Then lock the braces.
- Close the engine compartment cover.



Interior air filter (cab version) - check/clean/change

If the machine is operated in a particularly dusty environment, the interior air filter must be checked more often.



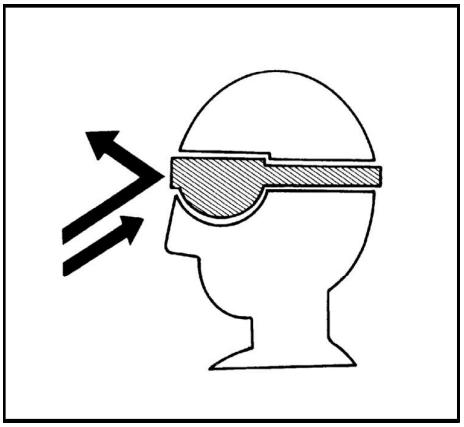
- Open the heating and air-conditioner unit service cover (page 151).
- Remove the screw (2).
- Open the cover plate (1).
- Remove the interior air filter (3).

Checking

- Inspect the interior air filter for contamination and damage. In case of heavy contamination, replace the interior air filter.

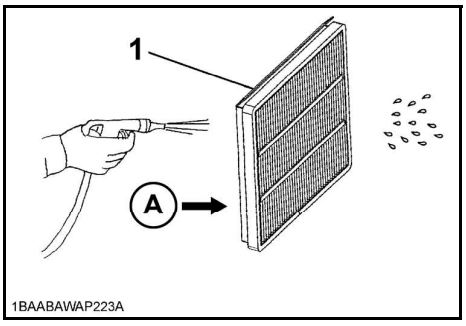
Cleaning

Clean only with filtered air at max. 2 bar pressure.



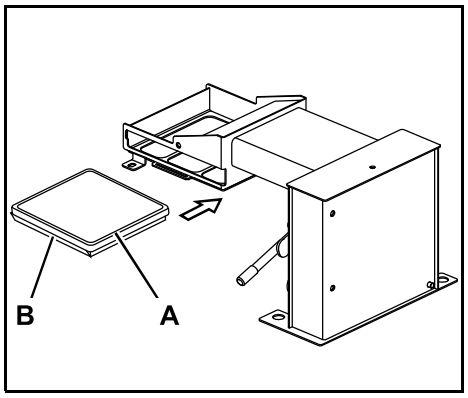
Always wear eye protection when working with compressed air.

- Clean the filter (1) with compressed air in direction "A", opposite the normal direction of flow.

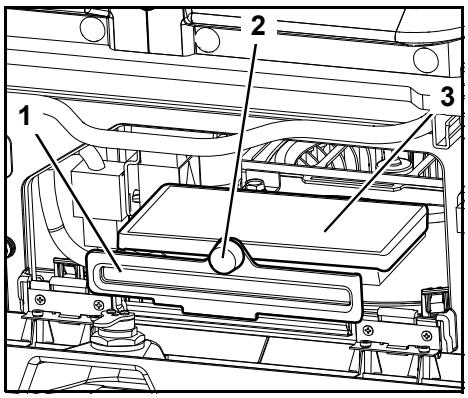


Take care not to damage the filter when installing it. A damaged filter would allow contaminated air to enter the air-conditioner assembly, causing severe damage.

Set the filter with the cushion (A) facing upward and with the V-flap (B) facing outwards. Wrong setting shortens the filter's service life.



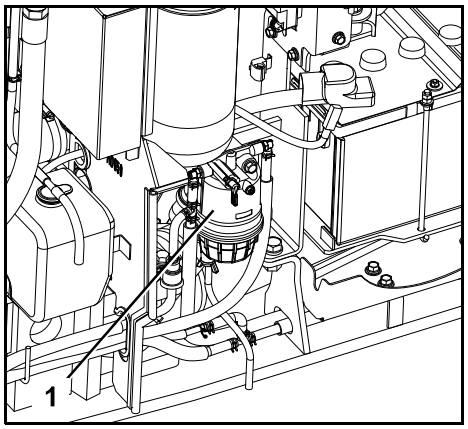
- Replace the interior air filter (3).
- Close the cover (1).
- Tighten the screw (2).
- Close the heating and air-conditioner unit service cover.



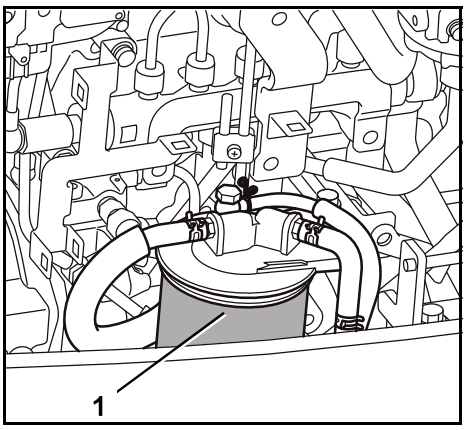
Fuel filter - change

Users must take appropriate actions to insure fuel is not contaminated during operation.

- Open the engine compartment cover (page 149).
- Open the side cover (page 150).
- Turn the cock (1) on the water separator to the "OFF" position.



Place cleaning cloths under the fuel filter (1) to prevent fuel from spilling onto the ground.



- Loosen and unscrew the filter using a filter key.
- Wet the rubber seal of the new filter with fuel.

*Do **not** add any fuel into the new filter cartridge before installing it. Debris in fuel can damage the engine.*

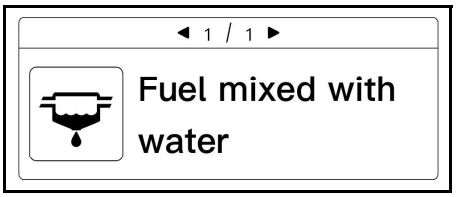
- Install a new filter and tighten it by hand.
- Turn the cock at the water separator to the ON position.
- Bleeding the fuel system (page 146).
- Close the engine compartment cover.
- Close the side cover.

Dispose of cleaning cloths according to the applicable environmental protection regulations.

If the fuel filter is not replaced regularly, the cleaning interval for the diesel particle filter can no longer be guaranteed. The diesel particle filter would be clogged earlier than expected.

Water separator - drain

Water and impurities in the fuel settle in the water separator. The water separator is equipped with a sensor that checks the fill level. If any such deposits form, a message will appear on the display as shown in figure on the right.

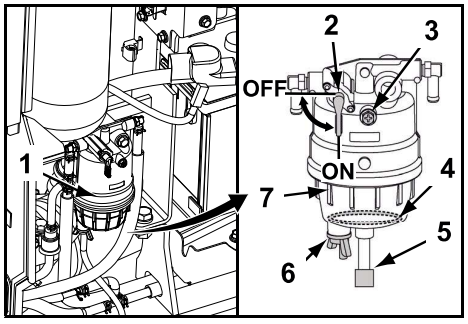


Risk of engine damages from water in the fuel!

Water reduces the lubrication capacity of the diesel fuel. The injection pump could be damaged and metal parts could corrode. Furthermore, the diesel particle filter's cleaning interval can no longer be guaranteed. The particle filter would be clogged earlier than expected. If the "Fuel mixed with water" malfunction indicator appears on the display, the water must be drained from the water separator immediately after the engine has stopped.

Always remove spilled fuel immediately.

- Open the side cover (page 150).
- Visual inspection of the water separator for water and sediments.



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the “OFF” position.
- Loosen the venting screw (3).
- Loosen the drain valve (6) and drain the impurities.
- Close the drain valve.
- Tighten the venting screw.
- Make sure that the sensor cable plug (5) is connected.
- Switch the shut-off valve to the “ON” position.
- Bleed the fuel system (page 146).
- Check the water separator for leaks.

Dispose of cleaning cloths according to the applicable environmental protection regulations.

- Close the side cover.

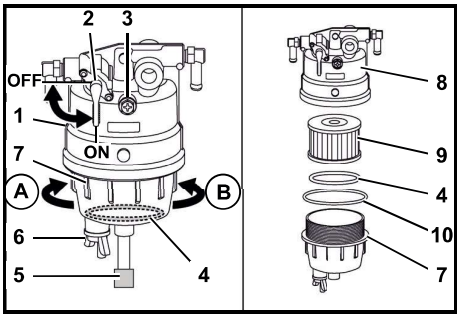
Water separator - clean

While changing the fuel filter, be careful not to allow dust or dirt into the fuel line and the fuel filter.

Keep the water separator away from dust and dirt during assembly.

Always remove spilled fuel immediately.

- Open the side cover (page 150).



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the “OFF” position.
- Disconnect sensor cable plug (5).
- Remove (A) the filter cup (7).
- Empty the filter cup and clean it with clean diesel fuel.
- Check the sealing ring (10) and replace if damaged.
- Screw on (B) the filter cup and tighten it by hand.
- Switch the shut-off valve to the “ON” position.
- Bleed the fuel system (page 146).
- Check the water separator for leaks.
- Connect sensor cable plug.

Dispose of cleaning cloths according to the applicable environmental protection regulations.

- Close the side cover.

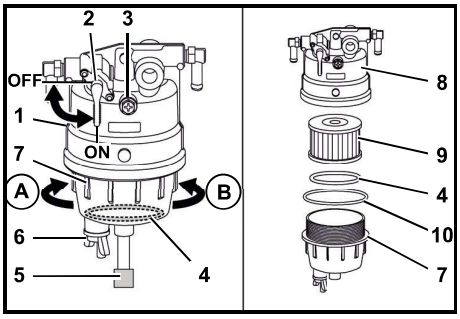
Water separator filter - change

While changing the fuel filter, be careful not to allow dust or dirt into the fuel line and the fuel filter.

Keep the water separator away from dust and dirt during assembly.

Always remove spilled fuel immediately.

- Open the side cover (page 150).



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the “OFF” position.
- Disconnect sensor cable plug (5).
- Remove (A) the filter cup (7).
- Remove the filter element (9) from the filter head (8).
- Empty the filter cup and clean it with clean diesel fuel.
- Insert a new filter element.
- Check the sealing ring (10) and replace if damaged.
- Screw on (B) the filter cup and tighten it by hand.
- Switch the shut-off valve to the “ON” position.
- Bleed the fuel system (page 146).
- Check the water separator for leaks.
- Connect sensor cable plug.

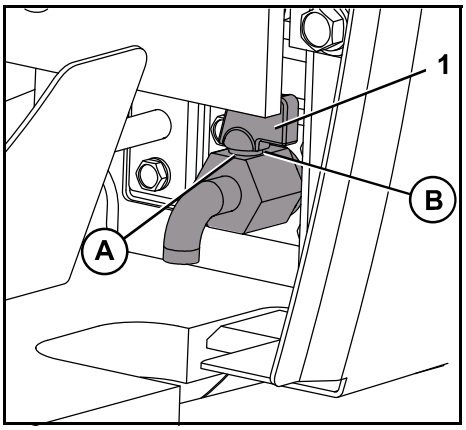
Dispose of cleaning cloths according to the applicable environmental protection regulations.

- Close the side cover.

Fuel tank - drain

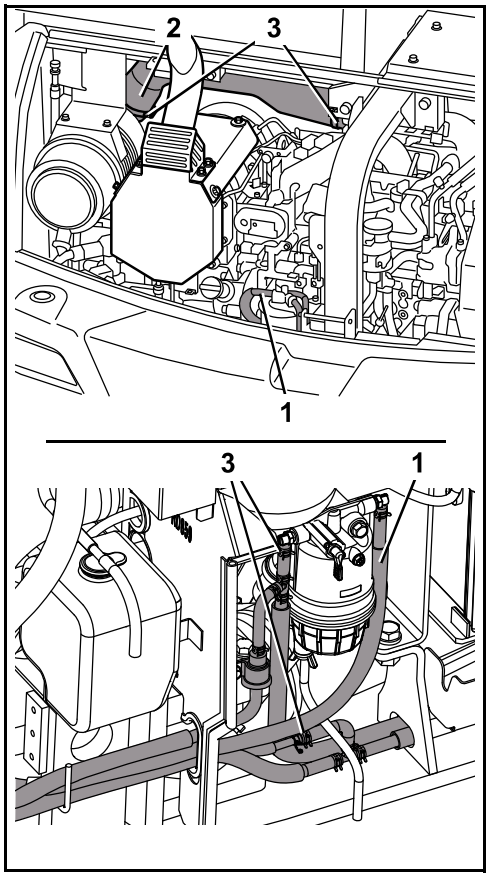
- Open the side cover (page 150).
- Place a container with a minimum capacity of 12 litres under the fuel drain valve (1).
- Open drain valve (A) and drain the water.
- Close the drain valve (B).

Dispose of fluid in the container according to the applicable environmental protection regulations.



Fuel lines and air intake hoses - check

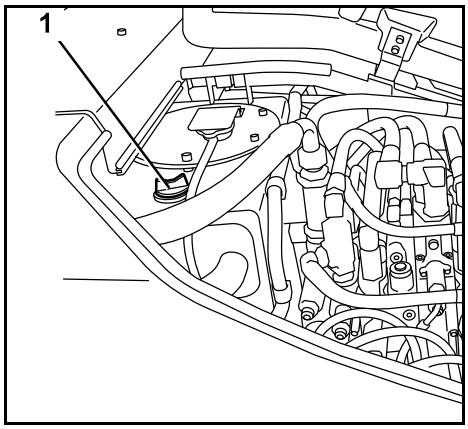
- Check all accessible fuel lines (1), air intake hoses (2) and clamps (3) to ensure that they are not damaged and are firmly seated.
- Repair or replace damaged parts.



Return filter in the hydraulic oil tank - change

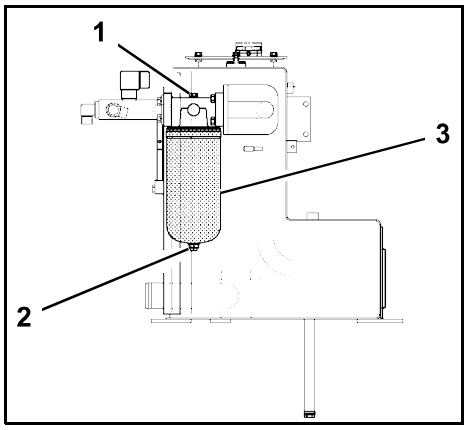
Pay attention to utmost cleanliness when servicing the hydraulic system. Users must take appropriate actions to insure hydraulic oil is not contaminated during operation.

Risk of injury by hot and pressurized hydraulic oil! This service may only be carried out after the hydraulic oil has cooled down. Slightly loosen the plug (1) to release pressure.



- Open the valve chamber cover (page 150).
- Open the side cover (page 150).
- Unscrew the plug (1).
- Unscrew the breather screw (1).
- Unscrew the oil drain plug (2) of the return filter (3) and collect the draining hydraulic oil in a suitable container.

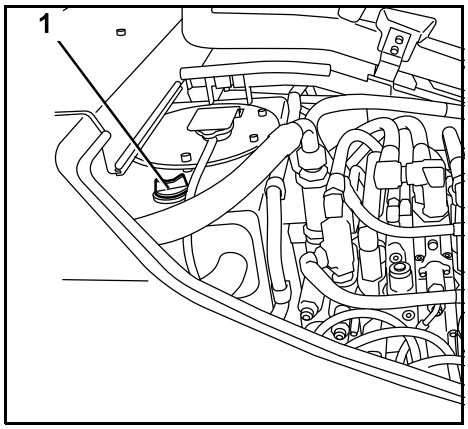
Discard the return filter in accordance with the prevailing environmental protection regulations.



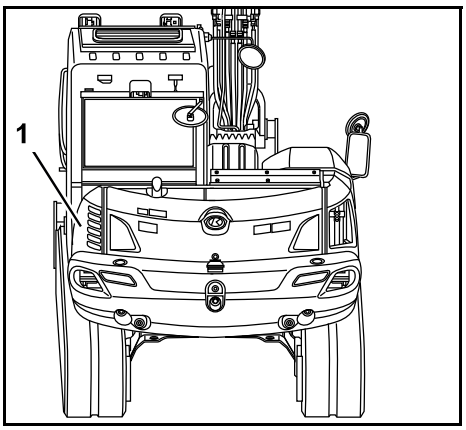
- Unscrew the return filter with a hook wrench.
- Lubricate the oil ring of the new return filter with some hydraulic oil.
- Tighten the return filter by hand.
- Reinstall the breather screw and the plug.
- Close the side cover and the valve compartment cover.

Pilot circuit filter - change

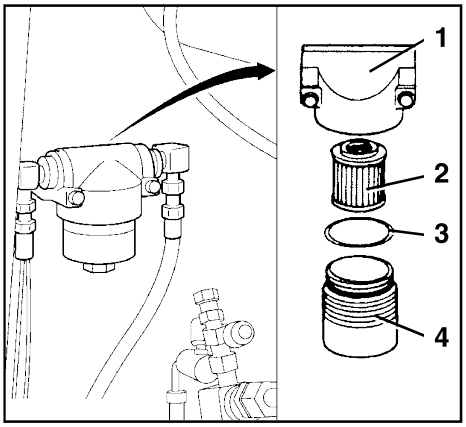
- Open the valve chamber cover (page 150).
- Remove the filler plug (1) from the hydraulic oil tank.



- Open the engine compartment cover (page 149).
- Remove the LH side cover (1).



- Remove the filter cup (4) from the filter head (1).
- Remove the filter element (2) from the filter head.
- Install new filter and new sealing ring (3).
- Screw in the filter cup and tighten it by hand.
- Refit the plug of the hydraulic oil tank.
- Start the engine (page 94). Let the engine run at idle speed to warm up, then stop it (page 97).
- Check the hydraulic oil level, add oil if necessary.
- Install the LH side cover.
- Close the engine compartment cover.
- Close the valve chamber cover.



Suction filter in the hydraulic oil tank - change

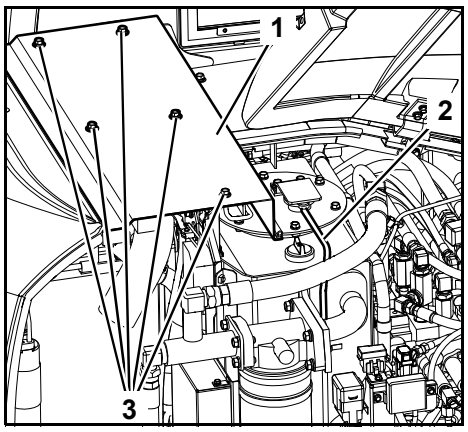
Pay attention to utmost cleanliness when servicing the hydraulic system.

This service may only be carried out after the hydraulic oil has cooled down.

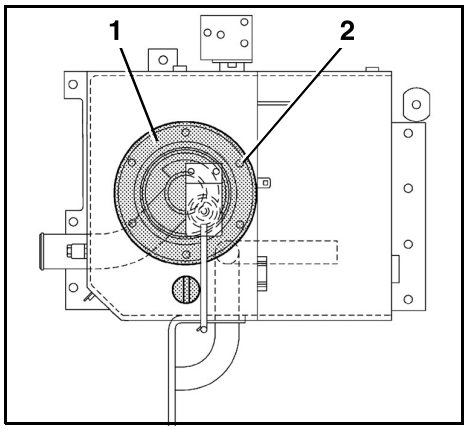
The suction filter must be replaced along with the hydraulic oil.

- Open the valve chamber cover (page 150).

- Drain the hydraulic oil (page 193).
- Unscrew the hex bolts (3) and remove the cover (1).
- Remove the breather hose (2).

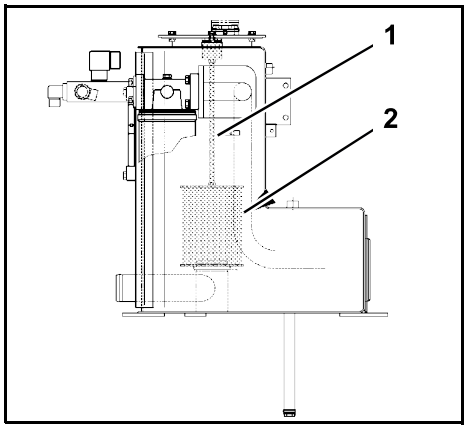


- Unscrew the hex bolts (2) and remove the hydraulic tank cover (1) with the seal.



- Remove the suction filter (2) with the rod (1) [suction filter assembly].
- If necessary, remove any residues with a clean, lint-free cloth.

Discard the suction filter and cleaning cloth in accordance with applicable environmental protection regulations.



- Insert the new suction filter assembly.
- Fit the hydraulic oil tank cover with the new seal and tighten it using the hex bolts.
- Install the breather hose.
- Install the cover and attach with hex screws.
- Fill hydraulic oil (page 194).
- Close the valve chamber cover.

Hydraulic oil - refill/change

Pay attention to utmost cleanliness when servicing the hydraulic system.

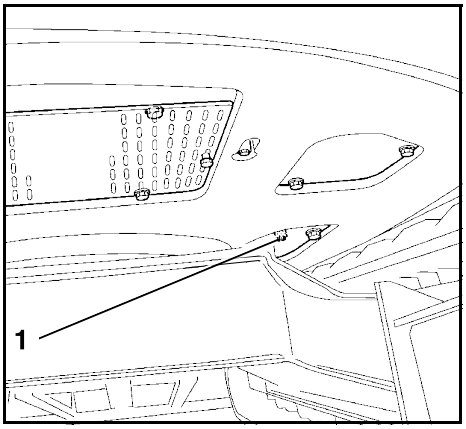
This service may only be carried out after the hydraulic oil has cooled down.

The suction filter must be changed along with the hydraulic oil.

- Operate the boom, arm, bucket and boom swing mechanism so that all hydraulic cylinders are extended halfway. Lower the dozer onto the ground. See the “Placing out of operation” section (page 131).
- Open the valve chamber cover (page 150).
- Open the side cover (page 150).

Draining the hydraulic oil

- Place a container with a minimum capacity of 150 l under the hydraulic oil drain plug.
- Remove the drain plug (1) and drain the hydraulic oil.
- Install the drain plug with a new sealing ring.



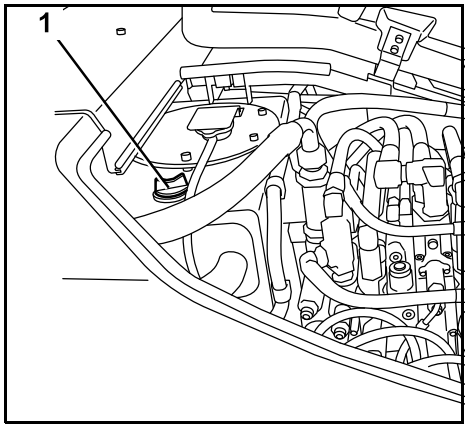
Filling the hydraulic oil

Before filling in a different brand of hydraulic oil, drain the hydraulic oil system completely.

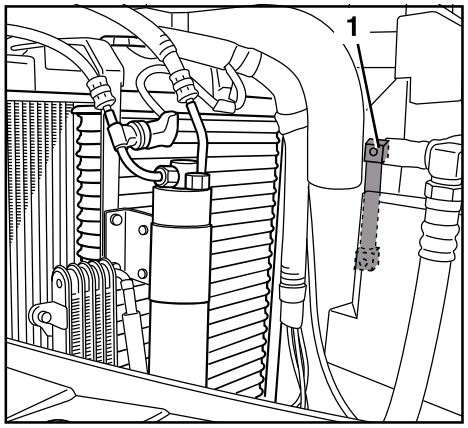
Filling quantity with oil change: approx. 75 l

Total hydraulic system capacity: 155.5 l

- Remove the filler plug (1) from the hydraulic oil tank.
- Insert a clean funnel with a strainer into the filler plug opening.



- Fill hydraulic oil to half way up the sight glass (1).
- Refit the plug of the hydraulic oil tank.
- Start the engine (page 94) and operate all control functions.
- Operate the boom, arm, bucket and boom swing mechanism so that all hydraulic cylinders are extended completely. Lower the dozer onto the ground. See the "Checking the oil level of the hydraulic system" section (page 86).
- Front attachments must be swivelled fully to the left.
- Check the hydraulic oil level, add oil if necessary.
- Close the side cover.
- Close the valve chamber cover.



Battery service

The battery can become damaged or may explode if the following instructions are not observed. Regular maintenance can extend the life cycle of the battery considerably.

- *For refillable-type batteries, never charge or use when the electrolyte level is below the [LOWER] (lower limit level) mark.*
- *Check the fluid level regularly and top up distilled water as required so that the electrolyte level is between the [UPPER] and [LOWER] levels.*
- *Check the battery regularly.*

When servicing a battery, always wear suitable protective gloves and eye protection.

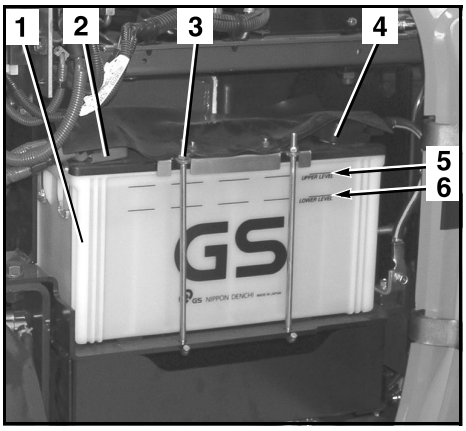
Battery - check

- Open the side cover (page 150).

The battery liquid level must be between the LOWER LEVEL (6) and UPPER LEVEL (5) markings. Top up with distilled water if necessary.

Do not open maintenance-free batteries!

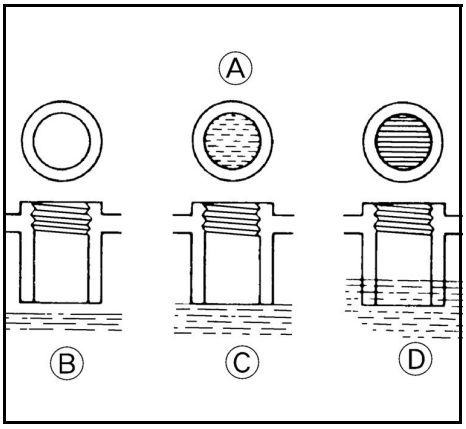
- Check that the battery (1) is firmly seated, tighten with nuts (3) if necessary.



Be careful when cleaning the positive terminal - risk of short circuit! Do not use metal tools.

- Check the battery terminals (2 and 4) for cleanliness, cleaning it if necessary and covering it with petroleum jelly.
- Check the battery fluid level (A):

  (B) Too low
  (C) Correct
  (D) Too high



- Close the side cover.

Battery - charge

Battery acid is very caustic. Avoid contact with battery acid under all circumstances. If clothing, skin or eyes have come into contact with battery acid, rinse the affected parts immediately with water. If the eyes are affected, immediately seek medical attention! Neutralise spilled battery acid immediately.

When servicing a battery, always wear suitable protective gloves and eye protection.

Charge batteries only in sufficiently ventilated rooms. Smoking, uncovered lights or fire are not allowed in these rooms.

Explosive gas is created when charging batteries. Open flames can cause an explosion.

Remove the plugs when charging batteries that are virtually empty. If the batteries are merely being recharged, the plugs can be left in the batteries.

The battery can only be charged if the starter switch is in the STOP position and the key removed.

- Make the battery accessible.
- Check the electrolyte level in the battery, adding distilled water if required.

When disconnecting and connecting the battery, always observe the specified order → Risk of short circuit.

- Remove the negative terminal cover and take off the cable clamp. Move the clamp to the side so as to avoid contact with the negative terminal.
- Remove the positive terminal cover.
- Connect the battery charger to the battery according to the instructions of the charger manufacturer. Choose the normal (gentle) charging method.
- Clean the battery after charging and replenish the electrolyte, if necessary.
- Check the acid density with a hydrometer. The acid density should be between 1.27 and 1.29 kg/l. If the acid density differs considerably among the individual cells of a battery, the battery is probably damaged. Check the affected battery with a battery tester and contact trained personnel.

Battery - change

When disconnecting and connecting the battery, always observe the specified order → Risk of short circuit.

- Make the battery accessible.
- Remove the negative terminal cover and take off the cable clamp. Move the clamp to the side so as to avoid contact with the negative terminal.
- Remove the plus terminal cover and take off the cable clamp. Move the clamp to the side so as to avoid contact with the positive terminal.
- Remove the battery retainer and lift the battery out of the swivel frame.

When replacing the battery, always install a battery of the same type with the same power rating and the same dimensions.

- Before installation, cover the battery terminals and cable clamps with petroleum jelly.
- Install the battery in the swivel frame and fasten it with the battery retainer. Make sure that the battery is installed tightly → Do not operate the machine with a loose battery.
- Connect the positive cable clamp to the positive terminal (+) of the battery, install the positive terminal cover.
- Connect the negative terminal (-) of the battery, install the negative terminal cover.

Lubrication

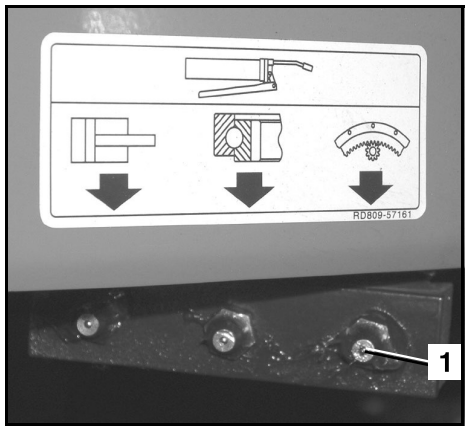
The following describes all lubricating tasks which should be performed with the superstructure.

Swivel gear - grease

- Fill grease through the grease nipple (1) with a grease gun.

Grease at each 90° position of the swivel gear. Fill a total of approx. 70 g of grease (approx. 20-30 shots with the grease gun at each position). Refer to the "Operating materials" section (page 210).

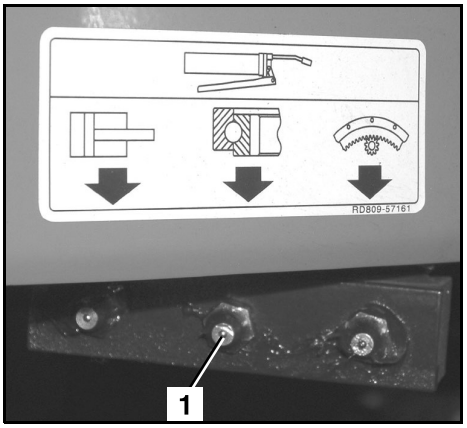
When moving the swivel frame, make sure no person or material is in the swivel area. Turn the starter switch to the STOP position and remove the key before the next greasing procedure.



- Operate the machine and swivel the swivel frame by 90° several times. After greasing, swivel the swivel frame 360° several times to distribute the grease evenly.

Swivel bearing - grease

- Fill grease through the grease nipple (1) with a grease gun.



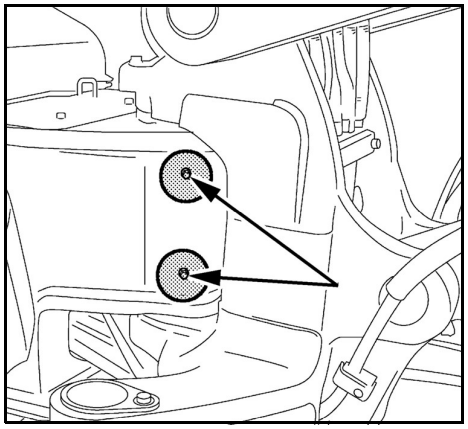
Grease at each 90° position of the swivel bearing. Using the grease gun, apply 5 shots at every position. Refer to the "Operating materials" section (page 210).

When moving the swivel frame, make sure no person or material is in the swivel area. Turn the starter switch to the STOP position and remove the key before the next greasing procedure.

- Operate the machine and swivel the swivel frame by 90° several times. After greasing, swivel the swivel frame 360° several times to distribute the grease evenly.

Swing bracket - grease

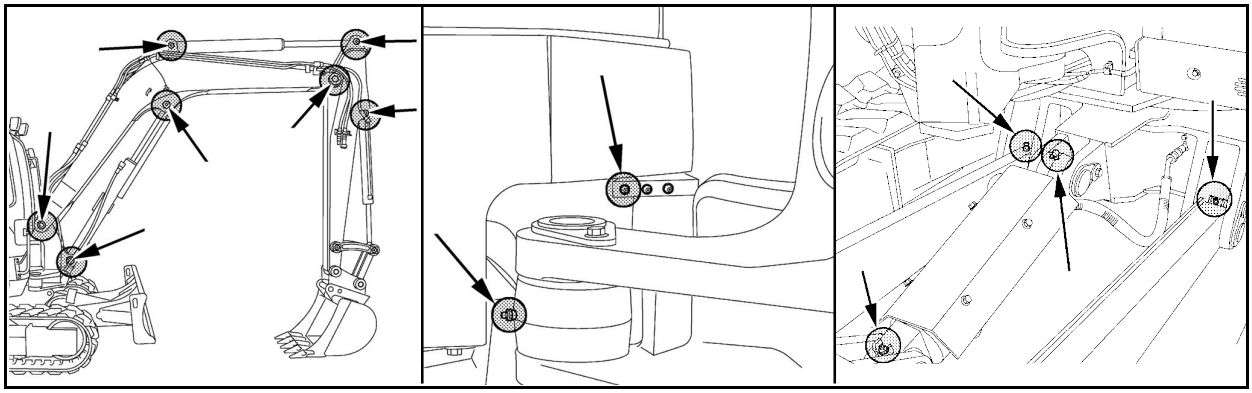
- Lubricate both greasing points (see figure to the right) – see the "Operating materials" section (page 210) – by injecting grease until fresh grease emerges.



Wipe emerged grease off immediately and store dirty cleaning cloths in the containers provided for disposal.

Other greasing points

- Start the engine (page 94).
- Position the boom, arm and dozer as shown in the figure. Stop the engine, remove the key. Refer to the “Excavation work (operating the controls)” section (page 115).



- Lubricate all greasing points with grease – see the “Operating materials” section (page 210) – until fresh grease oozes out.

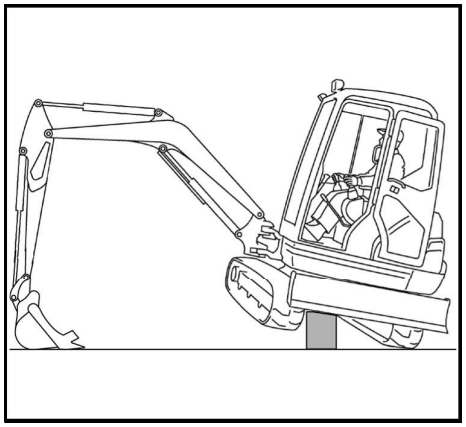
Wipe emerged grease off immediately and store dirty cleaning cloths in the containers provided for disposal.

Crawler tension - check/adjust

If the crawlers are too tight, wear is increased.

If the crawlers are too loose, wear is increased and the crawlers may come off.

When parking a machine with rubber crawlers, ensure that the seam (∞) is on top, halfway between the two sliders (see figure/1, Crawler tension (rubber) - check, page 201).



- Clean all parts of the running gear, paying particular attention to stones between the crawler and sprocket or idler. Clean the area of the crawler tensioning cylinder.
- Swivel the swivel frame 90° to the direction of travel as shown in the figure.
- Lower the front attachments on the ground and raise the machine approx. 200 mm off the ground on one side.

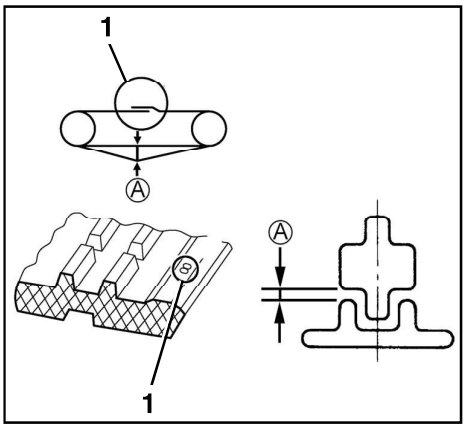
STOP *Have a guide supervise the procedure.*

STOP *Do not work under the machine, when lifting the machine itself with the attachment.*

STOP *Support the machine with a safety block or safety post and keep the lock lever for attachment control in the “LOCK” position.*

Crawler tension (rubber) - check

- The crawler seam (1) is half way between the idler and sprocket.



Crawlers with an SP mark can be checked and tensioned in any position.

- Check the crawler sag as shown in the figure.

Crawler sag "A" 25-40 mm

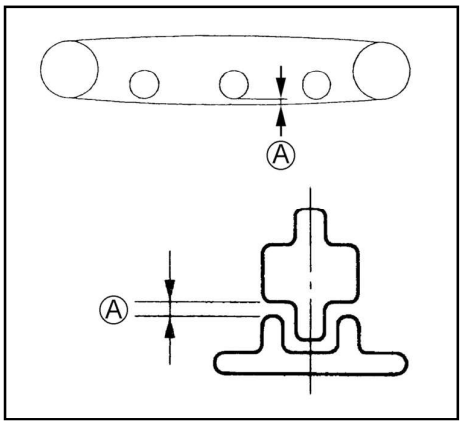
- If the crawler sag is more than 40 mm, adjust the crawler.
- If necessary, tighten or loosen the crawler.
- Start the engine and rotate the lifted crawler briefly.

Caution, the area around the rotating crawler must be free of persons! Turn the starter switch to the STOP position after turning and remove the key.

- Recheck the crawler tension, readjusting it if necessary.
- Perform the procedures on the second crawler.

Crawler tension (steel) - check

- Check the crawler sag as shown in the figure.



Crawler sag "A" 40-55 mm

- If the crawler sag is more than 55 mm, adjust the crawler.
- If necessary, tighten or loosen the crawler.
- Start the machine and rotate the lifted crawler briefly.

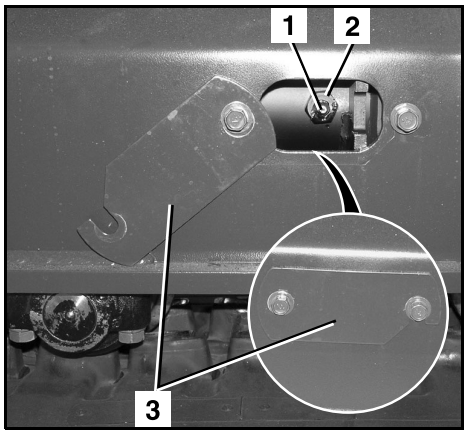
Caution: The area around the rotating crawler must be free of persons. Turn the starter switch to the STOP position after turning and remove the key.

- Recheck the crawler tension, readjusting it if necessary.
- Perform the procedures on the second crawler.

Crawler tension - adjust

Tightening the crawlers

- Remove the crawler tensioner cover (3).
- Position the grease gun on the grease nipple (1).
- Pump the grease gun until the specified crawler tension is obtained.



Loosening the crawlers

- Cautiously unscrew the pressure valve (2) and loosen the crawler.

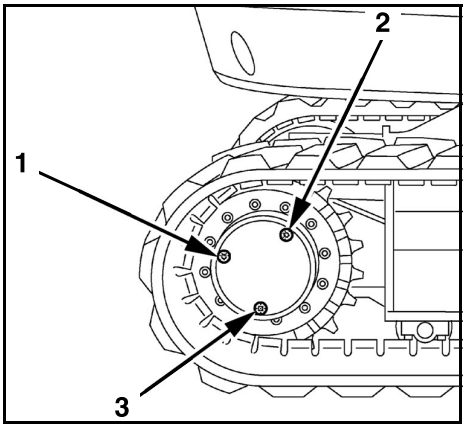
Grease could squirt out from the cylinder opening.

- Screw in the pressure valve and torque to 98-108 Nm.
- Tighten the crawler.

Drive unit oil - change

Only change the oil when the drive unit is warm to the hand; if not, drive the machine until it is warm.

- Park the machine on level ground so that the drain plug (figure below, position 3) is positioned at the bottom.
- Place a catch tray with a minimum capacity of 2 litres under the drain plug.
- Remove the drain plug and let the oil drain completely. Install the drain plug with a new sealing ring on it.
- Remove the oil filler plug (2) and oil level screw (1).
- Fill oil as specified in the "Operating materials" section (page 210). The oil level is the lower edge of the thread.



Capacities: 1.35 l

- Refit the oil filler plug and the set screw with a new sealing ring and tighten it.
- Perform the same service on the second drive unit.

Pipes and hoses of the heating and air-conditioner systems - check

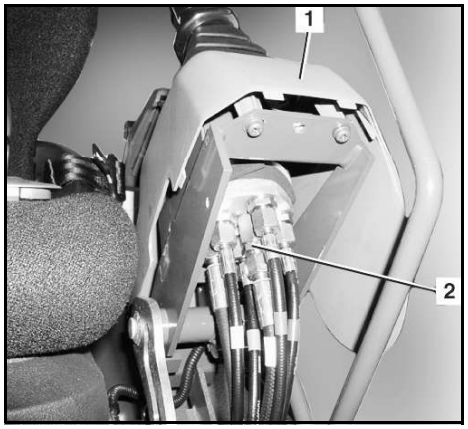
STOP

Carry out the inspection while the engine is cold.

- Open the engine compartment cover (page 149).
- Open the valve chamber cover (page 150).
- Open the side cover (page 150).
- Check that all the pipes and hoses of the heating and air-conditioner systems are in serviceable condition (no cracks, bulges or hard spots) and are firmly seated. If any damage is found, consult your KUBOTA dealer. Only trained personnel may work on the heating and air-conditioner systems.
- Close the engine compartment cover, the valve compartment cover, and the side cover.

In line filter - change

The replacement procedures are explained with the LH control lever as an example; the RH control lever filter replacement should be performed in the same manner.



- Release the pilot circuit pressure.
- Raise the LH control console (1).
- Remove the lower trim panels.
- Remove the hydraulic line (white).
- Unscrew the line filter (2).
- Screw in a new filter.
- Reconnect the hydraulic line.
- Reinstall the trim panels.
- Change the RH control lever line filter.

Electric lines and connections - check

- Check all accessible electric cables, connectors and connections for condition and tightness.
- Repair or replace damaged parts.
- Check the fuse box and fuse holders for oxidation and dirt, clean if necessary.

Refrigerant content (air-conditioner only) - check

Avoid eye and skin contact. The refrigerant causes severe frostbite.

When working with refrigerants, always wear an eye protection.

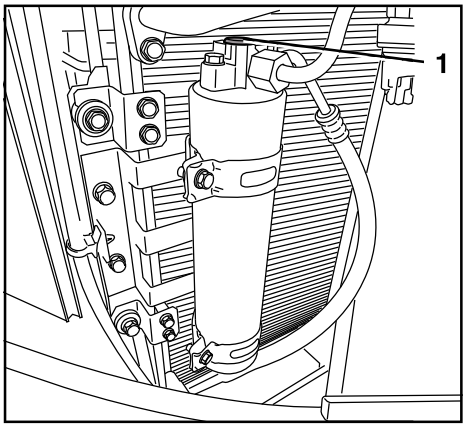
Avoid contact of refrigerant and open flames. Burning the refrigerant produces a toxic gas.

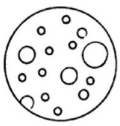
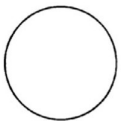
Do not detach or deactivate any components of the air-conditioner. Please contact your KUBOTA dealer.

This air conditioner contains fluorinated greenhouse gases (F-gases) (page 132).

A low refrigerant level affects the performance of the equipment and the air-conditioner will eventually automatically switch off. If you find out that the refrigerant level is too low, please contact your KUBOTA dealer.

- Open the side cover (page 150).
- Start the engine (page 94) and set an idle speed of 1500 1/min, if necessary.
- Set the temperature control to the "Cold" position and the fan to level 3, then switch on the air-conditioner.
- Using the sight glass (1), determine the refrigerant level according to the table below. If the refrigerant level is too low, please contact your KUBOTA dealer.



	Refrigerant level is OK	Small or no bubbles in the refrigerant
	Refrigerant level too low	Many large bubbles and foam in the refrigerant
	No refrigerant inside	Colourless and transparent

- Stop the engine.
- Close the side cover.

Viewing the operations log

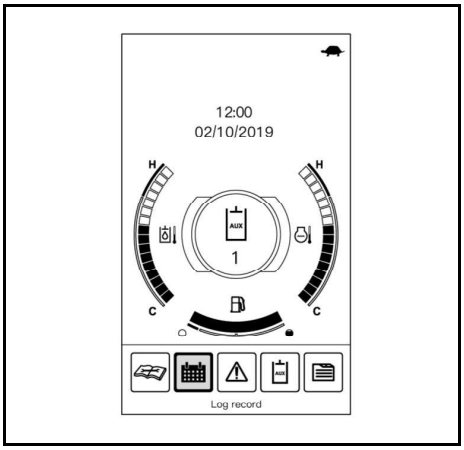
The operations log enables the operation of the machine over the previous three months to be checked.

- Turn the starter switch to the RUN position.
- Press menu switch on dial switch.

The menu bar appears in the display.

- Rotate jog dial to the right until “Log record” is selected in the display.
- Press Jog dial (enter switch).

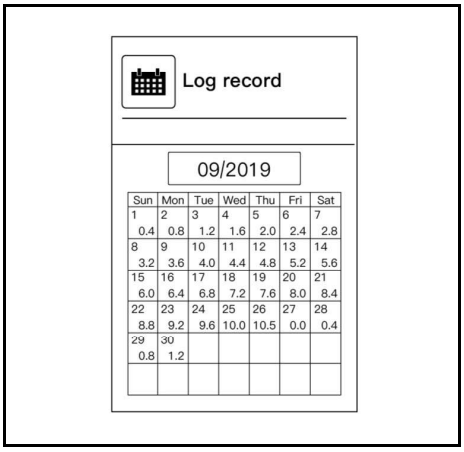
The Log record appears in the display.



A calendar appears in the display.

- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left until desired month is selected.
- Press Jog dial (enter switch).
- Log record of desired month appears in the display.

Certain days may be marked with (-) if the clock was reset or the battery disconnected. Operation of the machine on these days cannot be traced.



Bolted joints - check

The table below contains the torques for nuts and bolts. These may only be tightened with a torque wrench. Missing torques can be requested from KUBOTA.

Tightening torque for screws

Nm (kgf•m)

	4 T (4.6)	7 T (8.8)	9 T (9.8-10.9)
M 6	7.8~9.3 (0.8~0.95)	9.8~11.3 (1.0~1.15)	12.3~14.2 (1.25~1.45)
M 8	17.7~20.6 (1.8~2.1)	23.5~27.5 (2.4~2.8)	29.4~34.3 (3.0~3.5)
M 10	39.2~45.1 (4.0~4.6)	48.1~55.9 (4.9~5.7)	60.8~70.6 (6.2~7.2)
M 12	62.8~72.6 (6.4~7.4)	77.5~90.2 (7.9~9.2)	103.0~117.7 (10,5~12,0)
M 14	107.9~125.5 (11.0~12.8)	123.6~147.1 (12.6~15.0)	166.7~196.1 (17.0~20.0)
M 16	166.7~191.2 (17.0~19.5)	196.1~225.6 (20.0~23.0)	259.9~304.0 (26.5~31.0)
M 20	333.4~392.3 (34.0~40.0)	367.7~431.5 (37.5~44.0)	519.8~568.8 (53.0~58.0)

Tightening torque for hose clamps

Diameter	Part name	Tightening torque
Ø 10~14	Clamp (screw version 14)	2.5~3.4 Nm
Ø 12~16	Clamp (screw version)	2.5~3.4 Nm
Ø 13~20	Clamps (13-20)	2.5~3.4 Nm
Ø 19~25	Clamp (screw version)	2.5~3.4 Nm
Ø 31~40	Clamp (screw version)	2.5~3.4 Nm
Ø 36~46	Clamp (screw version)	2.5~3.4 Nm
Ø 15~25	Clamps (15-24)	4.9~5.9 Nm
Ø 26~38	Clamps (26-38)	4.9~5.9 Nm
Ø 32~44	Clamps (32-44)	4.9~5.9 Nm
Ø 40~55	Clamps (40-55)	4.9~5.9 Nm
Ø 44~53	Clamp (screw version)	4.9~5.9 Nm
Ø 49~60	Clamp (screw version 60)	4.9~5.9 Nm
Ø 50~60	Clamps (50-60)	4.9~5.9 Nm
Ø 58~75	Clamps (58-75)	4.9~5.9 Nm
Ø 66~88	Clamps (66-88)	4.9~5.9 Nm
Ø 77~95	Clamps (77-95)	4.9~5.9 Nm

Tightening torque for hydraulic hoses

Nm (kgf•m)

Dimension (ORS)	Nut type (Metal seal)	Nut type (ORS)
1/8 (-)	7.8~11.8 (0.8~1.2)	--
1/4 (9/16-18)	24.5~29.4 (2.5~3.0)	35.2~43.1 (3.6~4.4)
3/8 (11/16-16)	37.2~42.1 (3.8~4.3)	60.0~73.5 (6.1~7.5)
1/2 (13/16-16)	58.8~63.7 (6.0~6.5)	70.6~86.2 (7.2~8.8)
3/4 (1-14)	117.6~127.4 (12.0~13.0)	105.8~129.4 (10.8~13.2)
1 1/4 (-)	220.5~230.3 (22.5~23.5)	--

Tightening torque for hydraulic pipes

Size of the steel pipe (OD × ID × thickness)	Tightening torque Nm kgf•m	Wrench size (guide number)	Comments
8 × 6 × 1 mm 0.31 × 0.24 × 0.04 in.	29.4~39.2 3.0~4.0	17 mm 0.67 in.	When using a union nut
10 × 7 × 1.5 mm 0.39 × 0.28 × 0.06 in.	39.2~44.1 4.0~4.5	19 mm 0.75 in.	
12 × 9 × 1.5 mm 0.47 × 0.35 × 0.06 in.	53.9~63.7 5.5~6.5	21 mm 0.83 in.	
16 × 12 × 2 mm 0.63 × 0.47 × 0.08 in.	88.3~98.1 9.0~10.0	29 mm 1.14 in.	
18 × 14 × 2 mm 0.71 × 0.55 × 0.08 in.	127.5~137.3 13.0~14.0	32 mm 1.26 in.	
27.2 × 21.6 × 2.8 mm 1.07 × 0.85 × 0.11 in.	235.4~254.97 24.0~26.0	41 mm 1.61 in.	

Tightening torque for hydraulic adapters

Thread size (Pipe union)	Tightening torque Nm kgf•m		Wrench size (guide number)	Comments Steel pipe (OD)	
	R (conical thread)	G (round thread)			
1/8"	19.6~29.4 2.0~3.0	--	17 mm 0.67 in.	When using a steel pipe.	8 mm 0.31 in.
1/4"	36.3~44.1 3.7~4.5	With O-ring Tightening torque for connections 58.8~78.5 6~8	19 mm 0.75 in.		12 mm 0.47 in.
3/8"	68.6~73.5 7.0~7.5	With O-ring Tightening torque for connections 78.5~98.1 8~10	23 mm 0.91 in.		15 mm 0.59 in.
1/2"	83.4~88.3 8.5~9.0	With O-ring Tightening torque for connections 117.7~137.3 12~14	26 mm 1.02 in.		16 mm 0.63 in.
3/4"	166.6~181.3 17.0~18.5				

Tightening torque for elbow pipe joints with shim

Size	Nm	kgf•m
G1/8	15.0~16.5	1.5~1.7
G1/4	24.5~29.4	2.5~3.0
G3/8	49.0~53.9	5.0~5.5
G1/2	58.8~63.7	6.0~6.5
G3/4, G1	117.6~127.4	12.0~13.0
G1,1/4	220.5~230.3	22.5~23.5
7/8-14UNF	55.9~60.8	5.7~6.2

Operating materials

		Ambient temperature conditions	Recommendation		Filled at the factory		Note
			Viscosity	Quality standard	Brand	Type	
Engine oil	Engine	above 25 °C (77 °F)	SAE 30 SAE 10W-30 SAE 15W-40	API CJ-4 API CK-4	JXTG	JASO DH2 SAE 10W-30	-
		0 °C to 25 °C (32 °F to 77 °F)	SAE 20 SAE 10W-30 SAE 15W-40				-
		below 0 °C (32 °F)	SAE 10W SAE 10W-30 SAE 15W-40				-
	Idler Track roller		SAE 30	API CD	-	API CD SAE 30	-
Coolant			-	SAE J1034 MB 325.0 ASTM D3306 ASTM D4985	KUBOTA	LLC-N-50F Mixing ratio 50%	Always use distilled water to mix with antifreeze. Always follow the recommendations of the coolant manufacturer for the mixing ratio. Do not mix with other coolants.
Grease		Bolts, bushings, gears	NLGI-2	DIN 51825 KP2K-30	COSMO	Dynamax EP2	JCMAS GK verified NLGI-2 grease can also be used.*
Biodegradable hydraulic oil (Option)			-	ISO 15380	Panolin	HLP SYNTH 46	Less than 2% mineral oil remains in the system as per ISO 15380
Hydraulic oil		In winter and/or at low temperatures	ISO VG 32 ISO VG 46	-	SHELL	Tellus S2M46 ISO VG 46	JCMAS HK verified oil can also be used.*
		In summer and/or at high ambient temperatures	ISO VG 46 ISO VG 68				
Gear oil		Drive unit	SAE 90	API GL-4	-	API GL-4 SAE 90	-
Fuel**			-	EN 590	-	-	The fuel filled at the factory is not winter diesel. For preparing the machine for use in winter, fill the fuel tank with winter diesel and allow the engine to run for a few minutes.
Refrigerant			-	HFC-134a (R134a)	-	HFC-134a (R134a)	-

* Further information can be found on Japan Lubricating Oil Society's website (JALOS).
** Only use fuels with a maximum sulphur content of 10 mg/kg (20 mg/kg at the last distribution point), a minimum cetane rating of 45, and a maximum share of 7% fatty acid methyl ester (FAME).

Requirements regarding fuel use and maintenance of CRS diesel engines

Only use fuel and perform maintenance as directed in this operator manual.

1. Be sure to use Quality fuel (light oil) that meets the exhaust gas regulations for the Region where the engine is used.
Particular attention should be given to contamination and sulfur content in the fuel.
KUBOTA CRS diesel engines are equipped with an electronically controlled high-pressure fuel injection system (CRS: Common Rail System) and an exhaust emission control system (DPF: Diesel Particulate Filter) in order for the engines to perform satisfactorily and to meet required emission characteristics.
The electronically controlled high-pressure fuel injection system is made up of high precision components.
If the fuel gets contaminated with foreign matters, the system may malfunction or be adversely affected for its service life.
If the sulfur content is higher than approved, the product service life may get shorter.
It includes the early deterioration of engine oil, the wear of engine components and the catalyst degradation of the exhaust emission control system.

European Fuel Standard:	Sulfur Content Reference Value:
EN 590	0.0010 % (10 ppm) or less

2. Handle fuel, fuel tank and fuel filter with enough care to keep them free of foreign matters.
Do not use any fuel that is contaminated with dust and the like.
Do not refuel the machine in dusty environments. Do not replace the fuel filter in dusty environments.
During refuelling, be careful to prevent foreign matters from coming into the fuel tank.
Before replacing the filter, be sure to clean up its periphery.
Do not interrupt the replacement job. This is to keep the filter and its periphery free for foreign matters.
For the job, wear clean vinyl or similar gloves. Cotton work gloves and other fibre gloves may cause contamination.

3. Use only KUBOTA brand parts. Perform maintenance in strict accordance with instructions from KUBOTA.
Inspect and replace the water separator and fuel filter at regular intervals in accordance with the instructions provided by KUBOTA.
If any water separators and fuel filters other than the KUBOTA brand are used and if the specified servicing instructions are neglected, malfunctions similar to those in Item 1 above may occur, leading to engine breakdown.

4. The following cases are not covered by the warranty.
If the engine fails because of the use of any fuel and/or fuel filter not recommended by KUBOTA or because of the negligence of specified instructions, KUBOTA will not accept any refunds.

SAFETY INSPECTION

All safety inspections are based on the national worker's protection regulations, safety regulations and technical specifications applicable to the country in which the machine is operated.

The operator (page 20) should arrange for the safety inspections to be performed at specified intervals in accordance with national laws and regulations.

Based on their technical training and experience, the qualified personnel should have sufficient knowledge in the domain of the machine described here and be familiar with the applicable national work safety regulations, accident prevention regulations and the generally accepted technical rules so that they can assess the sound operating condition of the machine.

The appraisal and evaluation of a qualified person must be neutral and must not be influenced by other personal, economic or operational interests. The inspection is a visual and functional check of all components for condition and completeness and of the effectiveness of the safety devices.

The performance of the inspection must be documented in the form of an inspection report containing at least the following information:

- Date and scope of the inspection indicating all pending checks,
- Result of the inspection with a report of the determined faults,
- Assessment with respect to commencing or continuing operation,
- Information on necessary follow-up inspections and
- Name, address and signature of the inspector.

The owner/employer (company) is responsible for the observance of the inspection intervals. The acknowledgement and the elimination of the determined faults must be confirmed by the owner/employer in writing, along with the date, in the inspection report.

The inspection report must be kept on file at least until the next inspection.

TAKING OUT OF SERVICE AND STORAGE

If the machine is taken out of service for up to six months, the measures before, during and after taking it out of service must be carried out as described below. If the vehicle is to be taken out of service for a period of over six months, contact the manufacturer for additional measures.

Safety rules for taking out of service and storage

The general safety rules (page 17), the safety rules for operation (page 73) and the safety rules for maintenance (page 165) apply.

When taking the machine out of service, secure it against unauthorised use.

Storage conditions

The storage place must have a sufficient bearing capacity for the weight of the machine.

The storage place must be frost-free, dry and well ventilated.

Measures before taking out of service

- Clean and dry the machine thoroughly (page 174).
- Check the hydraulic oil level, top up if necessary (page 193).
- Change the engine oil and oil filter (page 180).
- Drive the machine to the storage place.
- Remove the battery (page 197) and store it in a dry and frost-protected room. If necessary, connect it to a trickle charger.
- Grease the swivel gear (page 197).
- Grease the swivel bearing (page 198).
- Grease all other greasing points (page 199).
- Grease the swing bracket (page 198).
- Grease the bucket bolt and the bucket linkage bolt (page 87).
- Check the antifreeze content of the coolant, add coolant if necessary (page 175).
- Grease the hydraulic cylinder piston rods.

Measures during taking out of service

- Charge the battery regularly (page 196).

Start-up after taking out of service

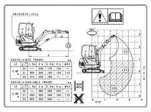
- If necessary, clean the machine thoroughly (page 174).
- Check the hydraulic oil for condensate water. Replace the oil if necessary (page 193).
- Remove the grease from the piston rods of the hydraulic cylinders.
- Install the battery (page 197).
- Check the safety devices for proper operation.
- Carry out the pre-operational services (page 83). If damage is detected during start-up, repair the damage before proceeding.
- If the safety inspection is due while the vehicle has been taken out of service, the inspection must be performed before start-up.
- Start the engine (page 94). Run the machine at idle and check all functions.

LIFTING CAPACITY OF THE EXCAVATOR

Constructive calculation of lifting capacity

- The lifting capacity of the excavator is based on ISO 10567 and does not exceed 75 % of the static tipping load or 87 % of the hydraulic lifting capacity of the machine.
- The lifting capacity is measured at the front bolt of the arm with the arm fully extended. The arm is fully in the dump position. The boom cylinder is the operating cylinder.
- The lifting conditions are:

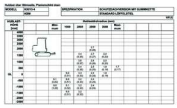
1. Swivel up to 360°, dozer up and down



The position of the dozer is not relevant to the maximum lifting capacity when swivelling up to 360°.
The illustration on the label is representative of both states: Dozer up and down.

2. Over front end, dozer down

3. Over front end, dozer up



- As well as the lifting conditions, the length of the arm also affects the permitted lifting capacities and the stability of the machine. Compare the dimensions of the machine arm with the details given in the lifting capacity tables, in order to use the correct lifting capacity table for your machine.

Dimensions for the arm, see table Arm versions in the Dimensions section (page 46).

Lifting attachment

- The lifting operation is only permitted when the excavator is equipped with the following safety systems as per EN 474-5:
  - Pipe safety valve on the boom cylinder (page 34)
  - Pipe safety valve on the arm cylinder (page 34)
  - Overload warning system (page 35)

- When the overload warning function is enabled, the machine may be used for lifting operation only. For more information, read the “Overload warning system” section in the “Safety rules” chapter (page 35).

- The lifting attachment is to be fastened to the attachment or to other parts of the excavator in such a manner as to exclude the possibility of the lifting rope accidentally unhooking.

- The installation on the attachment or the equipment must be such as to guarantee the optimum field of vision between the operator and the guide [the person who fastens the lifting rope to the lifting attachment].

- The lifting attachment is to be positioned so that the lifting rope is not deflected from its vertical direction of tension by other parts of the machine.

- The lifting attachment must be formed and positioned in such a manner as to exclude the possibility of the lifting rope accidentally slipping.

- Care must be taken when positioning the lifting attachment that there is no risk of restriction (e.g. becoming caught on something) during normal operation of the excavator or when working on any particular object.

- Load suspensions (e.g. hooks) may only be welded on by suitably skilled personnel. For this type of work, please contact your KUBOTA dealer.

- At every point of the implement or the boom, the lifting attachment must withstand a load of two-and-a-half-times its rated lifting load.

Load suspension device

A load suspension device with all the characteristics listed below is required:

- The system must withstand a load two-and-a-half times its rated lifting load, regardless of the point at which that load is applied.
- The system must be designed in such a way as to practically prevent any objects that have been lifted from falling from the lifting attachment, for example by means of a protective attachment designed for this purpose.
- The system must not allow the lifting attachment to slip from the attachment being lifted.

Do not lift loads that exceed the values indicated in the lifting capacity tables.

Always observe the maximum permissible lifting capacity of the hoisting gear (e.g. load hooks). Lifting loads over the maximum permissible lifting capacity is not allowed.

The values indicated in the tables only apply to level and hard grounds. When working on soft ground, the machine can tip over easily, as the load is concentrated on one side only and the crawler or the dozer can dig into the ground.

The values indicated in the tables only apply for loads without a bucket. If a bucket is used, the weight of the bucket must be subtracted from the values in the tables. If optional equipment is fitted (e.g. grapple kit, quick coupler, etc.), the weight of the equipment must be subtracted from the lifting capacity.

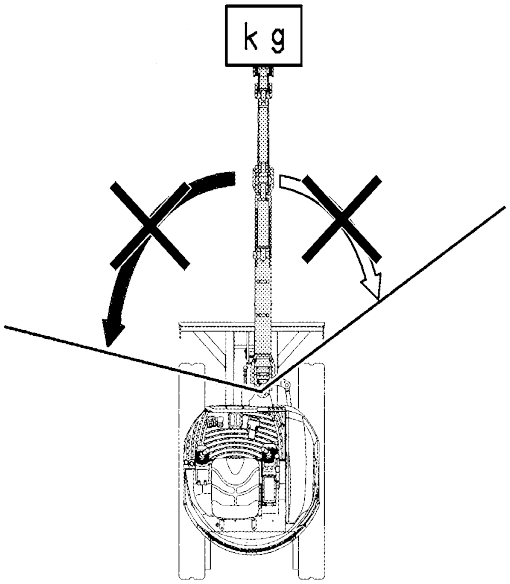
During lifting operations, the boom may not be swivelled to the left or right. The entire machine could tilt! In order to avoid inadvertent actuation, lower the locking flap for the boom swing pedal.

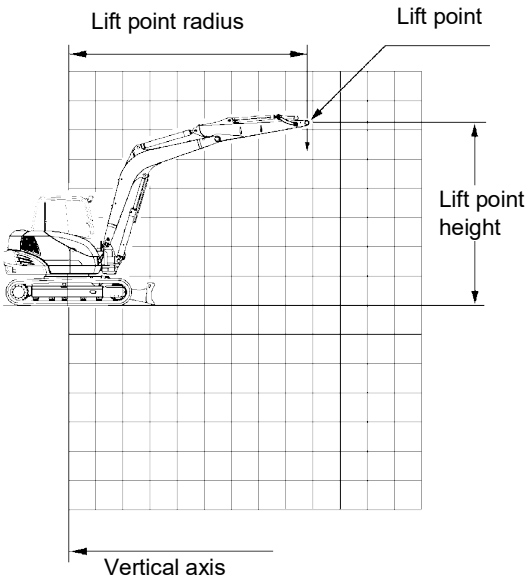
During lifting operations, driving/moving the crawler chassis is not permitted.

The permitted lifting capacity depends on the mass of the counterweight.
Observe lifting capacity plate on the machine before performing lifting activities.

Use utmost care to avoid any risk of tipping, slipping, or other potential risks implied when lifting loads.
The operator must

- Pick up the load at the centre
- avoid sudden steering movements,
- Make sure the load does not swing



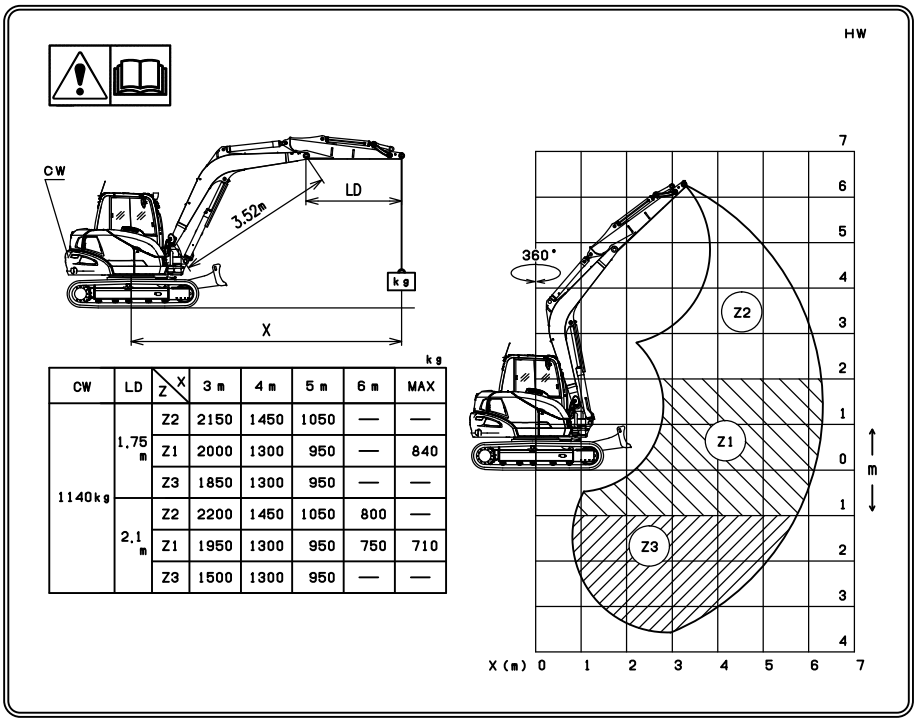


Information on inspecting lifting equipment in France

The test coefficients determined by KUBOTA and to be applied for the commissioning or recommissioning of machines equipped for lifting (article 10 et 11 de l'arrêté du 1 mars 2004 relatif aux vérifications des appareils et accessoires de levage) are 1.0 for static testing and 1.0 for dynamic testing.

Max. lifting load during swivel operation is 360°

KX085-5 / arm 1750 mm and arm 2100 mm / operating weight 8467 kg



kg

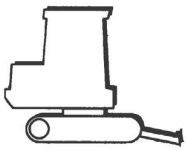
CW	LD	Z \ X	3 m	4 m	5 m	6 m	MAX
1140kg	1.75 m	Z2	2150	1450	1050	—	—
		Z1	2000	1300	950	—	840
		Z3	1850	1300	950	—	—
	2.1 m	Z2	2200	1450	1050	800	—
		Z1	1950	1300	950	750	710
		Z3	1500	1300	950	—	—

Lifting capacity over front end, dozer down, only with pipe safety valve on the dozer cylinder

MODEL	KX085-5

SPECIFICATION	OPERATING WEIGHT 8467 kg
	ARM 1750 mm

kN (t)

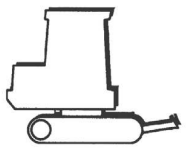
LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											
					Mini-mum	3000	4000	5000	Maxi-mum				
	7000												
	6000												
	5000						16.7 (1.70)						
	4000						17.2 (1.75)	16.2 (1.65)					
	3000					25.5 (2.60)	20.1 (2.05)	17.2 (1.75)					
	2000					36.8 (3.75)	24.0 (2.45)	19.1 (1.95)					
	1500						26.0 (2.65)	20.1 (2.05)	17.0 (1.74)				
	1000					31.4 (3.20)	27.4 (2.80)	20.6 (2.10)					
GL	0					41.7 (4.25)	28.4 (2.90)	21.1 (2.15)					
	-1000				37.2 (3.80)	38.2 (3.90)	27.0 (2.75)	20.1 (2.05)					
	-2000				46.1 (4.70)	31.4 (3.20)	22.5 (2.30)						
	-3000					18.1 (1.85)							
	-4000												

Lifting capacity over front end, dozer up

MODEL	KX085-5

SPECIFICATION	OPERATING WEIGHT 8467 kg
	ARM 1750 mm

kN (t)

LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											
					Mini-mum	3000	4000	5000	Maxi-mum				
	7000												
	6000												
	5000						16.7 (1.70)						
	4000						17.2 (1.75)	14.2 (1.45)					
	3000					25.5 (2.60)	20.1 (2.05)	13.7 (1.40)					
	2000					29.9 (3.05)	19.1 (1.95)	13.2 (1.35)					
	1500						18.6 (1.90)	13.2 (1.35)	10.7 (1.09)				
	1000					27.9 (2.85)	18.1 (1.85)	12.7 (1.30)					
GL	0					27.4 (2.80)	17.6 (1.80)	12.7 (1.30)					
	-1000				37,2 (3,80)	27,4 (2,80)	17.2 (1.75)	12.7 (1.30)					
	-2000				46.1 (4.70)	27.9 (2.85)	17.6 (1.80)						
	-3000					18.1 (1.85)							
	-4000												

Please note the model name and operating mass on the type plate (page 50).

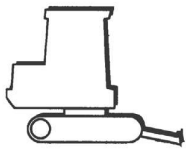
Lifting capacity of the excavator

Lifting capacity over front end, dozer down, only with pipe safety valve on the dozer cylinder

MODEL	KX085-5

SPECIFICATION	OPERATING WEIGHT 8467 kg
	ARM 2100 mm

kN (t)

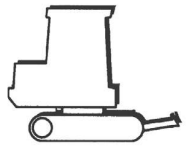
LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											
				Mini-mum	2000	3000	4000	5000	6000	Maxi-mum			
	7000												
	6000												
	5000						14.2 (1.45)						
	4000						15.2 (1.55)	14.7 (1.50)					
	3000					21.6 (2.20)	18.1 (1.85)	16.2 (1.65)	15.2 (1.55)				
	2000					32.3 (3.30)	22.5 (2.30)	18.1 (1.85)	15.7 (1.60)				
	1500					37.7 (3.85)	24.5 (2.50)	19.1 (1.95)	16.2 (1.65)	15.8 (1.61)			
	1000					40.7 (4.15)	26.0 (2.65)	20.1 (2.05)	16.7 (1.70)				
GL	0					42.1 (4.30)	27.9 (2.85)	21.1 (2.15)	16.7 (1.70)				
	-1000			28.4 (2.90)	33.3 (3.40)	39.7 (4.05)	27.4 (2.80)	20.6 (2.10)					
	-2000			42.1 (4.30)	52.9 (5.40)	34.3 (3.50)	24.5 (2.50)	17.2 (1.75)					
	-3000				35.3 (3.60)	24.0 (2.45)	15.7 (1.60)						
	-4000												

Lifting capacity over front end, dozer up

MODEL	KX085-5

SPECIFICATION	OPERATING WEIGHT 8467 kg
	ARM 2100 mm

kN (t)

LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											
				Mini-mum	2000	3000	4000	5000	6000	Maxi-mum			
	7000												
	6000												
	5000						14.2 (1.45)						
	4000						15.2 (1.55)	14.2 (1.45)					
	3000					21.6 (2.20)	18.1 (1.85)	14.2 (1.45)	10.3 (1.05)				
	2000					30.9 (3.15)	19.1 (1.95)	13.7 (1.40)	10.3 (1.05)				
	1500					29.4 (3.00)	18.6 (1.90)	13.2 (1.35)	9.8 (1.00)	9.3 (0.95)			
	1000					28.4 (2.90)	18.1 (1.85)	13.2 (1.35)	9.8 (1.00)				
GL	0					27.4 (2.80)	17.6 (1.80)	12.7 (1.30)	9.8 (1.00)				
	-1000			28.4 (2.90)	33.3 (3.40)	27.4 (2.80)	17.2 (1.75)	12.3 (1.25)					
	-2000			42.1 (4.30)	52.9 (5.40)	27,4 (2.80)	17.2 (1.75)	12.3 (1.25)					
	-3000				35.3 (3.60)	24.0 (2.45)	15.7 (1.60)						
	-4000												

Please note the model name and operating mass on the type plate (page 50).

OPTIONAL EQUIPMENT

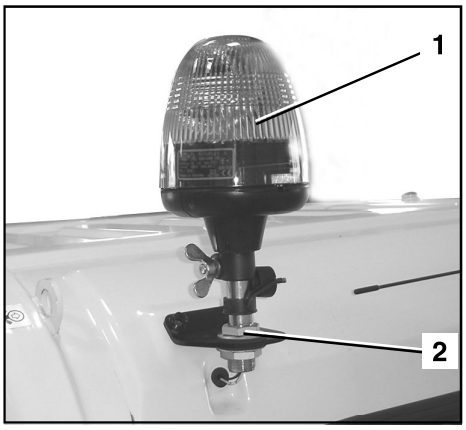
The optional equipment approved for this machine by the respective countries is described in the following segments. For more optional equipment, please contact your KUBOTA dealer.

Optional equipment from other manufacturers may only be fitted after prior written approval from KUBOTA. Also see the "Approved use" section (page 19).

KUBOTA rotary beacon

A rotary beacon (1) is available for the machine as an optional piece of equipment. The beacon is mounted at the rear end of the cab roof with a clip-on pedestal (2).

The rotary beacon is switched on and off using the rotary beacon switch. See the “Right control console” section (page 56).



KUBOTA pipe safety valve

A pipe safety valve prevents the sudden loss of oil in the connected hydraulic cylinder in the event of a pipe or hose bursting in the hydraulic circuit. This prevents, for example, the load or attachment from lowering suddenly or the machine from tipping precariously when operating the bulldozer blade in support mode to increase stability.

Excavators that will be used for lifting operations must be equipped with at least one pipe safety valve on the boom cylinder and arm cylinder, together with an overload warning system (page 34) according to EN 474-5.

If the dozer is being used to increase the machine’s stability, an additional pipe safety valve must be installed in accordance with EN 474-1.

The pipe safety valve can be factory mounted or retrofitted by your KUBOTA dealer.

The pipe safety valve is adjusted in the factory on the particular excavator.

Manipulating the pipe safety valve will void the warranty.

Any manipulation can result in substantial personal injuries, even death, and is therefore strictly prohibited.

The manipulation and repair of the pipe safety valves is prohibited. They may only be replaced by your KUBOTA dealer as a kit.

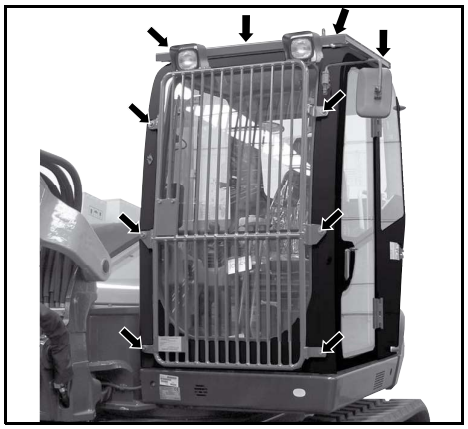
Note on use

- Check the pipe safety valve lead seal before using the excavator. Do not carry out any excavating work if the lead seal is missing and/or the pipe safety valve is damaged.
- In case machines equipped with a warning device experience an overload, the boom must be lowered until the load rests on the ground. To prevent personal injuries and damage to equipment, do not operate any other functions (e.g. moving the swivel frame).
- Swinging the boom is not permitted during the lifting operation.

KUBOTA gravel guard

The gravel guard is a protective grid which protects the operator against objects falling down or being thrown up.

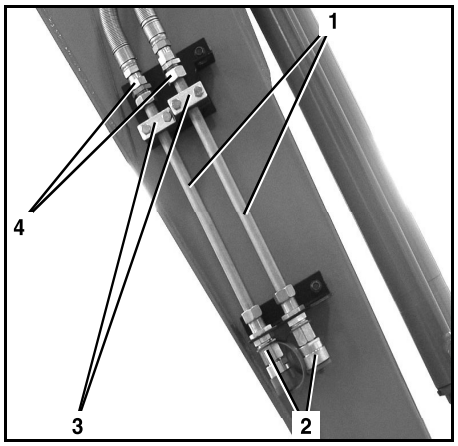
It is bolted onto the mounting points (see arrows) on the cab.



KUBOTA auxiliary port kit

The Auxiliary port kit is a set of pipe extensions (1) with quick release couplings (2) and mountings (3) for the existing standard ports (4) at the arm.

It is used to extend the existing ports and for tool-less attachment of the equipment using quick release couplings.



A dirty quick coupler can impede the installation or cause a leak.

- Make sure to clean the quick release couplings before connecting them.

KUBOTA quick coupling systems and attachments

The quick coupling system is designed to be mounted with pins on the arm and the bucket linkage.

It is designed to accommodate KUBOTA bucket accessories only.

The related operating instructions are attached to the excavator's operating instructions.

For further information, please contact your KUBOTA dealer.

KUBOTA bucket accessories

For additional bucket accessories, please contact your KUBOTA dealer.

The size, weight and arm bracket of the excavator are important factors in the selection of attachments. These factors must be made known to the attachment manufacturer when ordering attachments, and be observed by the operator when operating the excavator. Various attachments are nevertheless of limited use only.

Replacing the bucket

When replacing the bucket or other attachments, make sure to wear an eye protection, a helmet and protective gloves.

During attaching and detaching, chippings and burrs may occur at the bolts or bushings. These may cause severe injuries.

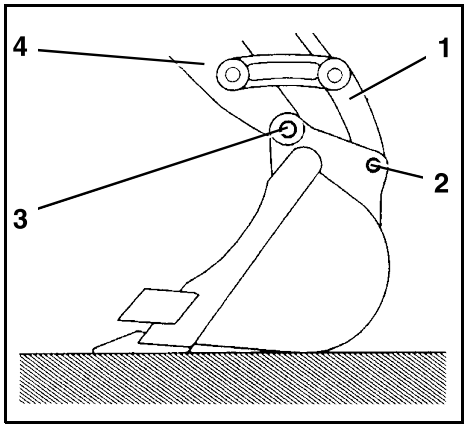
Never use your fingers for the alignment of the components (linkage, bucket, arm). The components may sever your fingers by uncontrolled movements.

When attaching the bucket or other attachments, O-rings and spacers are required. They are supplied with the machine.
Please contact your KUBOTA dealer if spacers with different dimensions are required.

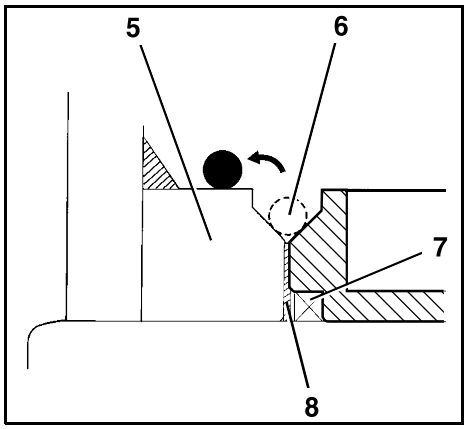
Removing the bucket

- Lower the bucket onto a flat, even surface.
- Stop the engine.
- Ensure that the components indicated below remain free of dirt and dust.
- Unscrew the safety pins on bolts (2) and (3).

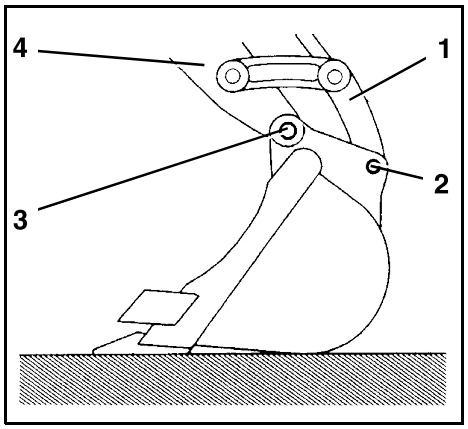
The bucket is stored with bolts (2) and (3) in a total of four bearing eyes. An O-ring is positioned at each bearing eye.



- Pull O-ring (6) from the nut to bearing eye (5).

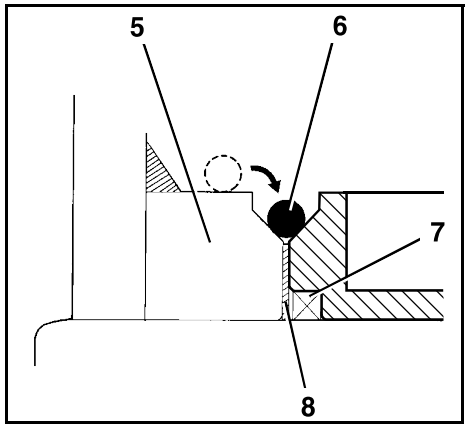


- Remove bolts (2) and (3) from the bearing boreholes.
- Make sure not to lose the spacers (figure above/8).
- Start the engine and raise the arm and/or the boom slightly until the bucket is exposed.
- If a new bucket is not to be attached right away, insert the O-rings, bolts and spacers into the bearing boreholes and secure them from being lost with the safety pins.



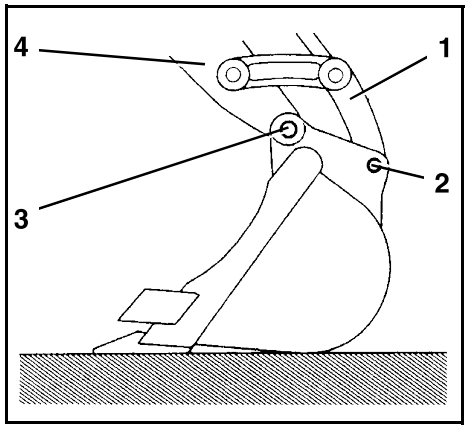
Attaching the bucket

- Ensure that the components indicated below are free of dirt and dust.
- Ensure that an O-ring (6) is attached to each bearing eye (5).
- Check the O-rings and dust protection seals (7) for damage, replace them if necessary.



- Align the bearing borehole of the arm (4) with the bearing borehole (3) on the bucket.
- Insert a suitable spacer (figure above/8) on each side of the arm bearing (3).

The axial clearance must be within 0.6 mm. If the clearance is larger, then insert suitable spacers.



- Drive the bolts (3) into the bearing borehole.
- Align the bearing borehole of the bucket linkage (1) with the bearing borehole (2) on the bucket.
- Drive the bolts into the bearing borehole.
- Screw on the safety pins in order to hold the bolts in position.
- Insert the O-rings from the bearing eyes down into the nut. Ensure that the O-ring is completely inside the nut.
- Lubricate the bolts with grease.

SOFTWARE INFORMATION

This product includes "Open Source Software" (OSS).

You must read and accept the terms and conditions of each license (OSS license).

This product includes OSS that is made available under the "GNU Lesser General Public License" (LGPL).

If you have purchased this product, you may reverse engineer the OSS to the extent that such OSS licenses are applied but only when you need to do so to use this software.

This product includes OSS that is made available under the "GNU General Public License" (GPL), LGPL, or the "Mozilla Public License 2.0" (MPL).

If you purchase this product, you may obtain, copy, modify and distribute the applicable source code under the OSS licenses.

The OSS license and source code is available at the following URL:
https://www.kubota.com/products/opensource/index.html

Disclaimer

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KUBOTA and any third party that has the right to use OSS shall not be liable for any damages arising out of this software and its use or the inability to use it.

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