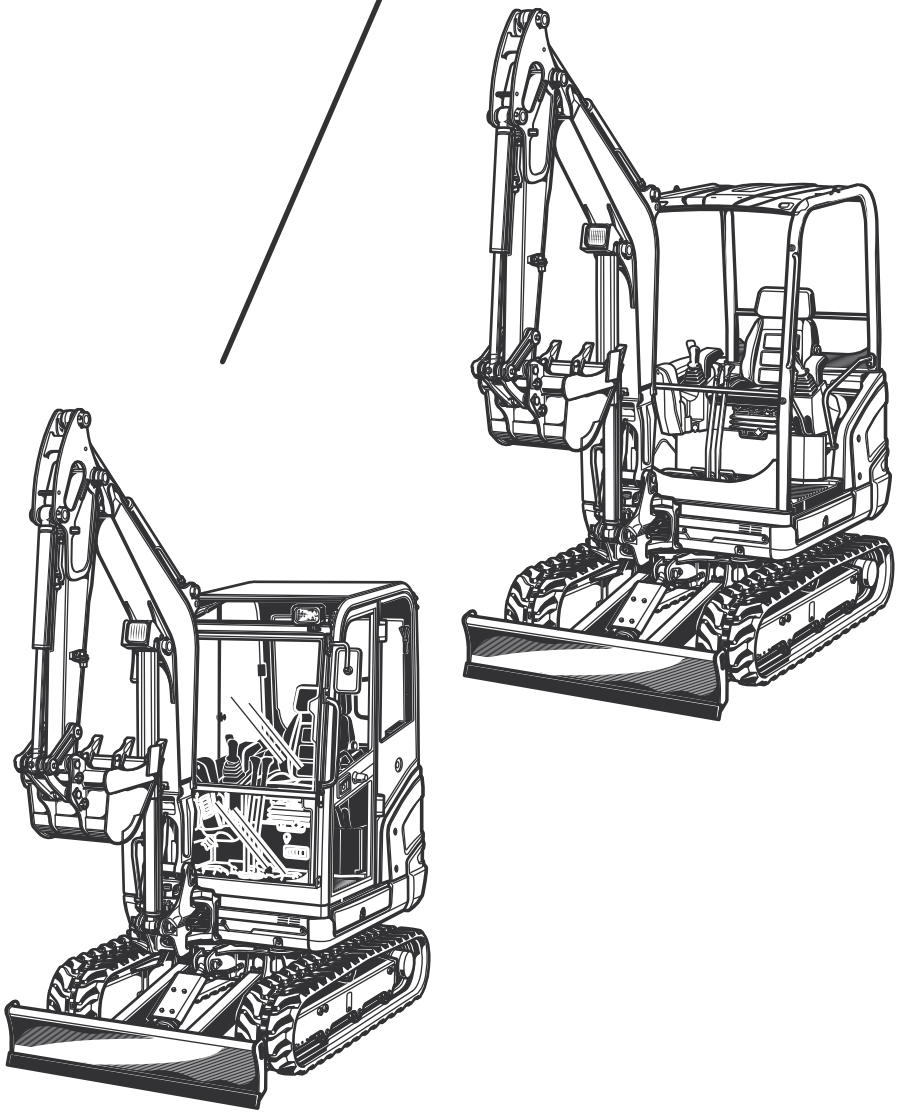
Kubota

COMPACT EXCAVATOR

GB

MODEL

KX027-4
KX030-4



KX027-4 - Valid from serial no. 52158
KX030-4 - Valid from serial no. 50740

CE

OPERATING INSTRUCTIONS

RG268-8135-6 **- Original -** **01/2019**

Dear valued customer,

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

Type:
Year of construction:
Serial #:
Shipment date:

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 13). 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 excavators 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)
e.g.	for example
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	measured 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
OPG	Operator Protective Guard
resp.	respectively
RMS	Root Mean Square
ROPS	Roll-Over Protective Structure (Roll-over protection)
s	second
SAE	Society of Automotive Engineers
t	ton
TOPS	Tipping Over Protective Structure
V	Volt

General symbols


Warning light


Fuel indicator


Engine oil indicator


Charge indicator


Glow indicator


Hydraulic oil


Travel speed


Low speed


Forward travel


Backward travel


Raise boom


Lower boom


Arm dump


Arm crowd


Bucket crowd


Bucket dump


Indicator coolant temperature


Service interval indicator


Set clock indicator


Swivel boom (left)


Swivel boom (right)


Dozer up


Dozer down


Lever direction


Control lever direction


Rotary beacon


Display selector switch


Auxiliary port indicator


Working lights


Horn


Bolted


Released


Fan


Menu button


Insert key


Pull out Key


Indirect return flow


Direct return flow

GENERAL INFORMATION

Foreword

These operating instructions only apply to KUBOTA excavators KX027-4 and KX030-4, which comply with the following EC declaration of conformity (page 10).

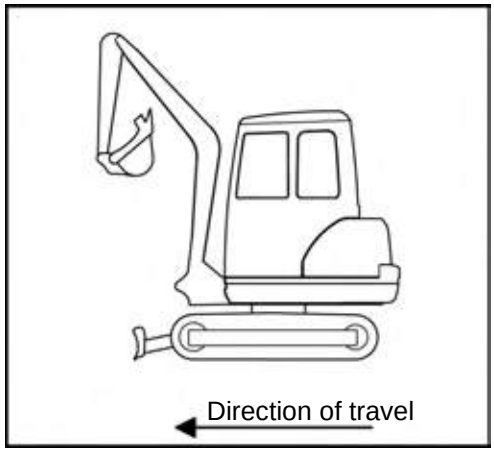
The safety instructions and the rules and regulations for the use of excavators given in these operating instructions apply to the excavators mentioned in this documentation.

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 data in the operating instructions apply for all models. Information pertaining solely to the equipment variant high-spec is labelled with (KX027-4 HI or KX030-4 HI). Information pertaining to optional equipment is labelled with (optional). Differences are highlighted (e.g. cab version or KX027-4, KX030-4)

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 14).

EC Declaration of Conformity

CE With the EC Declaration of Conformity, KUBOTA Baumaschinen GmbH certifies that the excavator complies with any applicable standards and regulations valid at the time it was placed on the market. The CE conformity marking is located on the type plate and indicates compliance with the regulations.

If the excavator is modified or retrofitted without the approval of the manufacturer, the safety of the excavator may be affected, thus rendering the EC declaration of conformity invalid.

The EC declaration of conformity is attached to the operating instructions upon delivery of the excavator.

Keep the EC declaration of conformity in a safe place and show it, if requested, to the responsible authorities.

Should the EC declaration of conformity be lost, please contact your KUBOTA dealer.

Hereby, ASAHI DENSO CO., LTD. declares that the radio equipment type [CZ106] is in compliance with Directive 2014/53/EU. The full text of the EU 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 excavator under the supervision of an experienced operator.

Operator

According to industrial safety regulations, only persons who have completed 18 years of age, were instructed in the operation of the excavator, 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 excavator independently.

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

Trained personnel

Trained personnel are skilled persons with a technical qualification who are able to determine damage to the excavator 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.

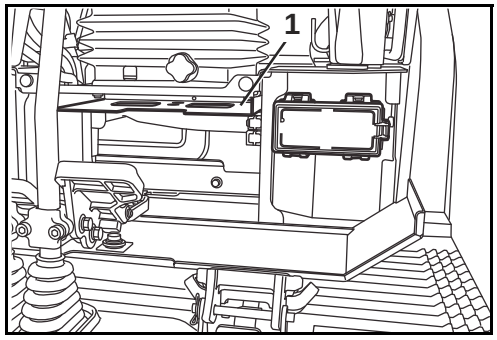
Qualified personnel

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 excavator. If the operating instructions have become illegible due to continuous use, the owner (operator) must order a replacement from the manufacturer.

A tray (1) for the operating instructions is located on the front side of the seat console below the cover plate.



Spare parts

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

- Serial # of the excavator 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 excavator.
- 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 excavator 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 excavator. Above and beyond this, the safety rules and regulations applicable for the site must also be observed.

Hazards occurring during the handling of the excavator:

- The excavators are 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 excavator or other property, can occur. The excavator(s) may only be used

  → 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 10). 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 excavator
- Improper starting, operation and maintenance of the excavator
- Operation of the excavator with defective 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 excavator
- Poor surveillance of machine parts subject to wear
- Catastrophes caused by the effect of foreign objects or force majeure

It is the responsibility of the owner to ensure that

- The safety rules are observed (page 13)
- Unapproved use (page 15) and unauthorised operation are prevented
- The excavator is used properly (page 15) and 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 excavator 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 excavators specified in these operating instructions may only be used for loosening, excavating, lifting, transporting and dumping soils, rocks and other materials, as well as for work with the dozer or with a breaker. The load may be transported largely without driving the excavator. 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 15) of the excavators documented in these operating instructions – is considered 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 excavator to lift loads without the proper equipment for lifting operations,
- Using the excavator in contaminated environments
- Using the excavator in enclosed spaces without sufficient ventilation
- Using the excavator under conditions of extreme temperatures (extreme heat or cold)
- Using the excavator for underground work
- Using the excavator to transport persons in the bucket
- Using the excavator for demolition work, with the danger of falling objects (e.g. tearing down walls).

Special duties of the owner

The owner of the excavator in the context of these operating instructions is any person or company that uses the excavator 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 excavator.

The owner must ensure that the excavator 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.

The operator must provide persons who work with or on the excavator 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.

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 specified in the Technical Data (page 39).

Noise emission

The noise levels were determined using the method for determining the guaranteed sound pressure level of ISO 4871 based on directive 2000/14/EC, Appendix VI.

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 directive 2002/44/ EC in order to consider individual magnitudes of influence.

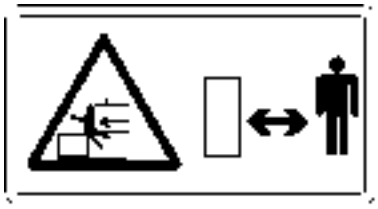
Danger, warning and safety labels on the machine

Care of danger, warning and safety labels

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

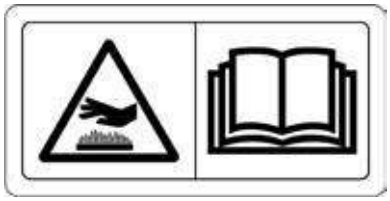
The positioning of the danger, warning and safety instructions is illustrated in the following figures.

1) Code #: RG158-5727-0



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 #: RG268-5724-0

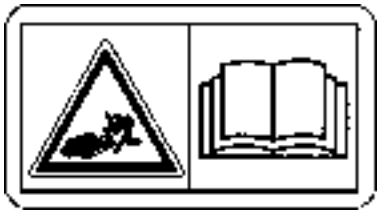


Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot components.
- Before working on the engine, please read the operating instructions.

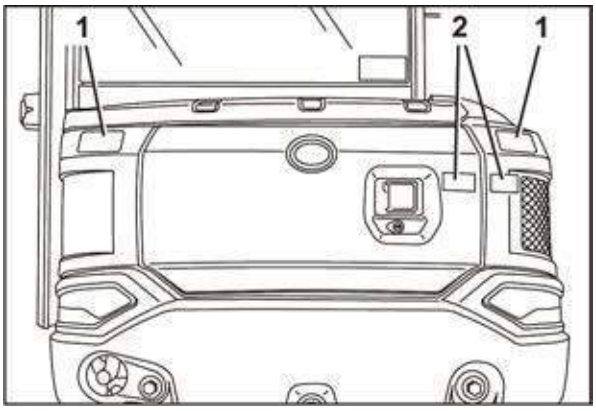
3) Code #: R2491-5736-0

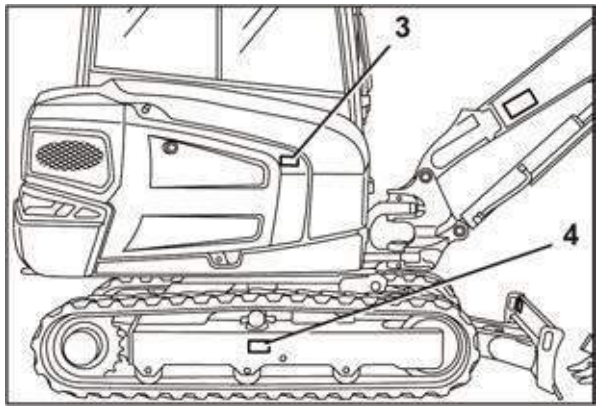
Risk of fire from inflammable diesel fuel!
Inflammatory vapours can occur in the fuel tank, which may go up in flames as a result of an ignition source.
- Do not use open flames in the vicinity of the fuel tank.

4) Code #: RG138-5791-0



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!

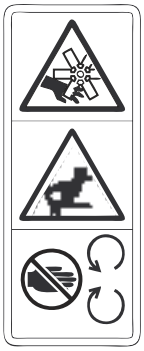




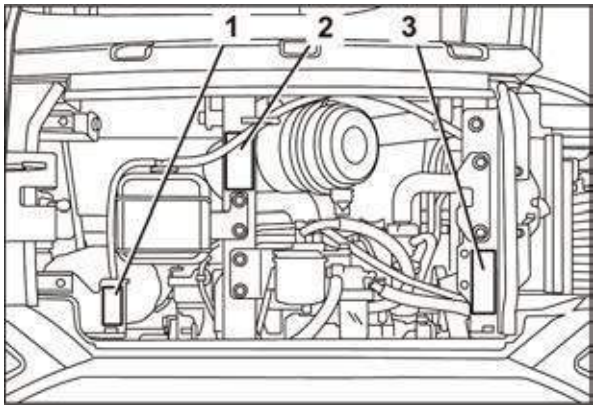
1) Code #: RG158-5785-0
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot parts, such as exhaust muffler, etc.

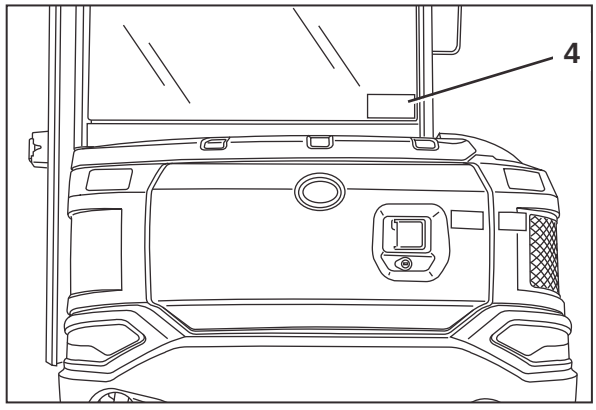
2) Code #: RG158-5754-0
Risk of fire from hot components!
Escaping liquids can get onto hot components and catch fire.
- Before working on the engine, please read the operating instructions.

3) Code #: RG158-5789-0
Danger of cutting from rotating components!
The rotary fan can cut into the extremities.
Danger of crushing from rotating components!
The rotary belt drive can draw in limbs and crush them.
- Do not reach into rotating components.



4) Code #: RG158-5723-0
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.





1) Code #: RG158-5722-0

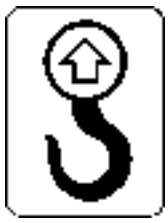
Mortal danger from moving excavator!

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 remain within the swinging range of the boom.
- Ensure safe distance to obstacles and sufficient freedom of movement.

2) Code #: R2491-5796-0

Attachment point for lifting gear.



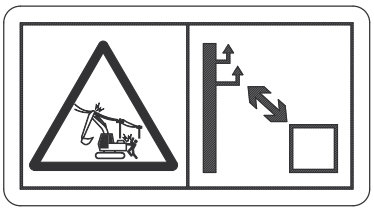
3) Code #: RG268-5789-0

Mortal danger by crushing!

A low safe distance to the arm can impede an emergency exit from the danger zone. Being crushed by the arm can result in severe injury or death.

- Do not stand in the working area of the arm.
- Ensure safe distance to obstacles and sufficient freedom of movement.

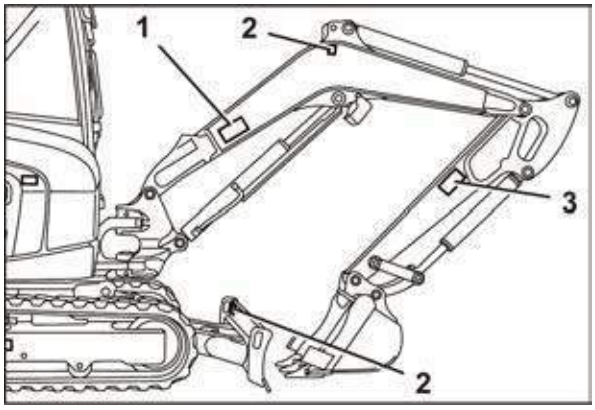
4) Code #: RG268-5788-0

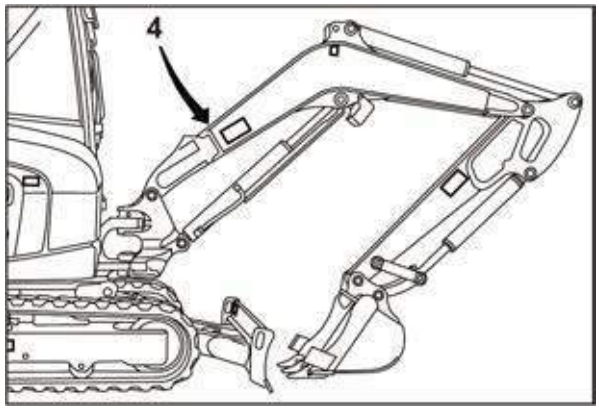


Danger due to electric current!

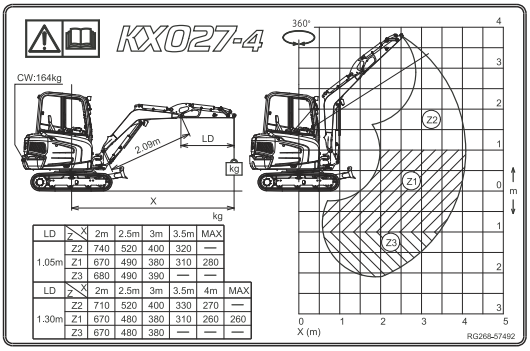
When working in the vicinity of overhead power lines without a sufficient safe distance between them and the machine, the electricity can jump onto the machine.

- Maintain a safe distance from overhead power lines.





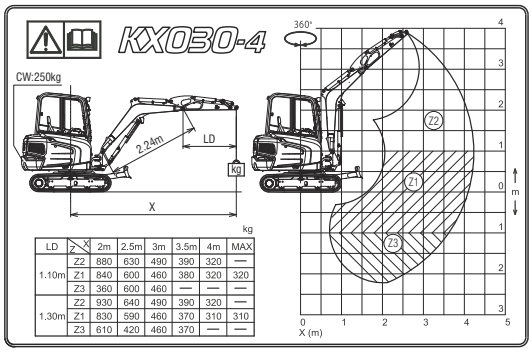
1) Code #: RG268-5749-0
Max. lifting capacity when rotating up to 360°
KX027-4 (cab)



LD	Z \ X	2m	2.5m	3m	3.5m	MAX
1.05m	Z2	740	520	400	320	—
	Z1	670	490	380	310	280
	Z3	680	490	390	—	—

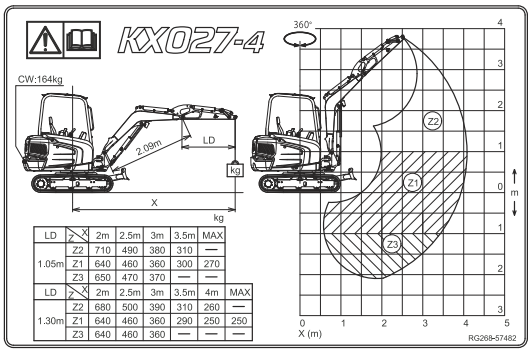
LD	Z \ X	2m	2.5m	3m	3.5m	4m	MAX
1.30m	Z2	710	520	400	330	270	—
	Z1	670	480	380	310	260	260
	Z3	670	480	380	—	—	—

Code #: RG468-5749-0
Max. lifting capacity when rotating up to 360°
KX030-4 (cab)



LD	Z \ X	2m	2.5m	3m	3.5m	4m	MAX
1.10m	Z2	880	630	490	390	320	—
	Z1	840	600	460	380	320	320
	Z3	360	600	460	—	—	—
1.30m	Z2	930	640	490	390	320	—
	Z1	830	590	460	370	310	310
	Z3	610	420	460	370	—	—

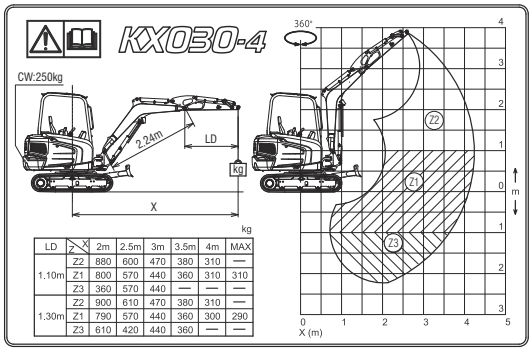
2) Code #: RG268-5748-0
Max. lifting capacity when rotating up to 360°
KX027-4 (canopy)



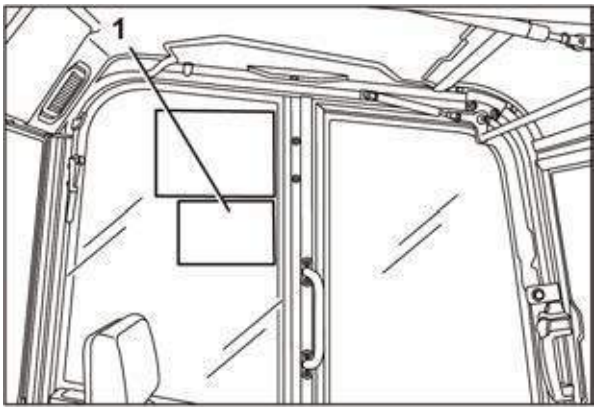
LD	Z \ X	2m	2.5m	3m	3.5m	MAX
1.05m	Z2	710	490	380	310	—
	Z1	640	460	360	300	270
	Z3	650	470	370	—	—

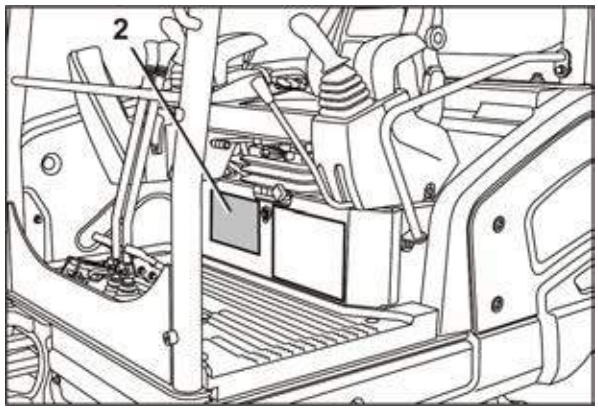
LD	Z \ X	2m	2.5m	3m	3.5m	4m	MAX
1.30m	Z2	680	500	390	310	260	—
	Z1	640	460	360	290	250	250
	Z3	640	460	360	—	—	—

Code #: RG468-5748-0
Max. lifting capacity when rotating up to 360°
KX030-4 (canopy)

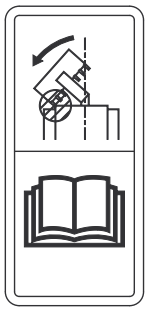


LD	Z \ X	2m	2.5m	3m	3.5m	4m	MAX
1.10m	Z2	880	600	470	380	310	—
	Z1	800	570	440	360	310	310
	Z3	360	570	440	—	—	—
1.30m	Z2	900	610	470	380	310	—
	Z1	790	570	440	360	300	290
	Z3	610	420	440	360	—	—





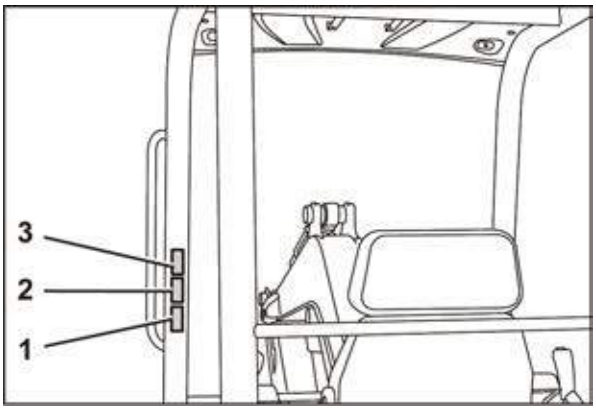
1) Code #: RG268-5717-0
Caution! Risk of component damage!
When using a wider or deeper bucket, take good care when swinging or retracting the front attachments to make sure that the bucket does not hit the cab.
- Read the Operating Instructions for the attachment.

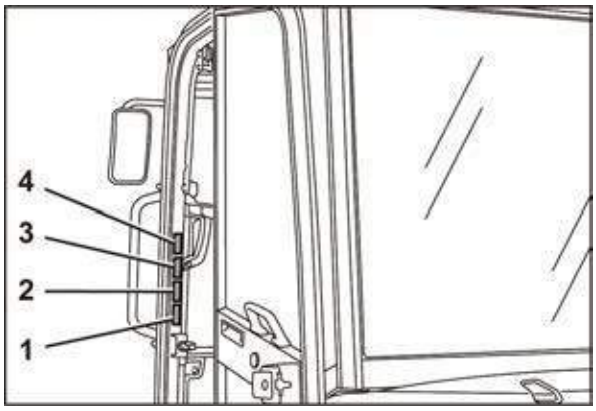


2) Code #: RG268-5783-0
Mortal danger by crushing!
Low safe distance to the excavator and to obstacles can prevent an emergency exit from the danger zone. Crushing by excavator results in severe injury or death.
- Before leaving the machine, lower bucket to the ground.
- Lift the control lever lock, turn the starter switch to the STOP position and remove the key.

3) Code #: RG268-5743-0
Risk of personal injury!
- Always buckle up.

4) Code #: RG268-5729-0
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.





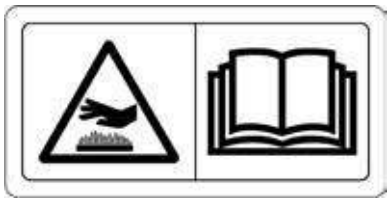
1) Code #: RG308-5702-0

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.

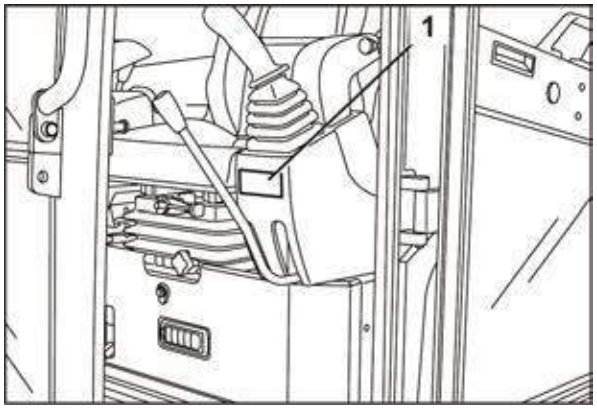
2) Code #: RG158-5724-0

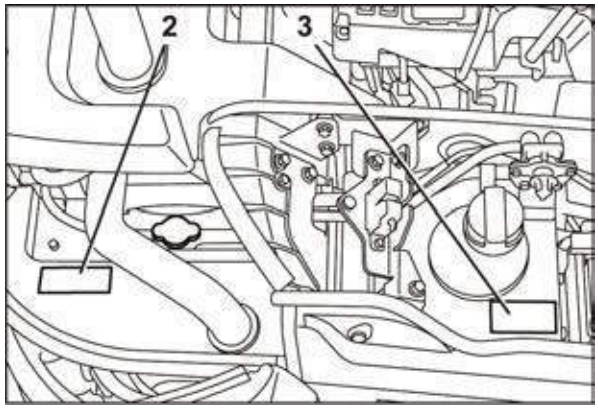
Danger of injury from liquids under pressure!
Escaping hydraulic oil under pressure can penetrate into the skin.
Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Apertures, e.g., ventilation systems, and hot components, must not be covered with hands.

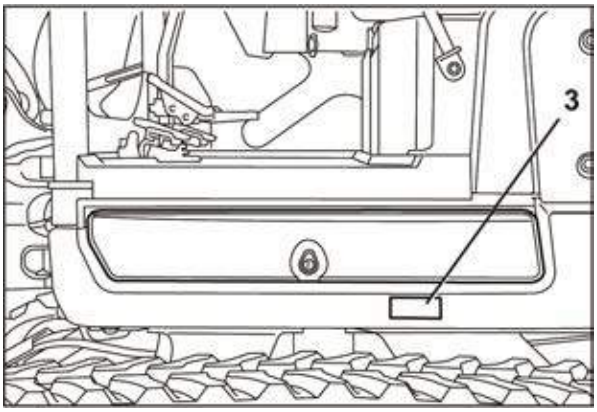
3) Code #: RG268-5724-0



Risk of burns from hot components!
Surfaces can be hot and lead to burns.
- Do not touch hot components.
- Before working on the engine, please read the operating instructions.

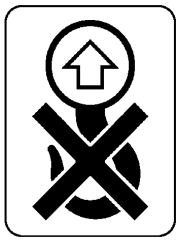




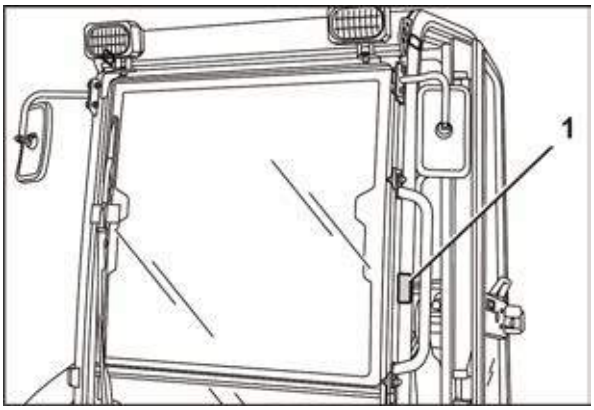


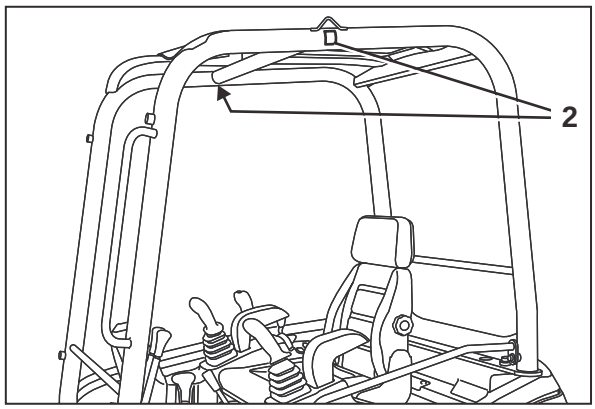
1) Code #: RG158-5734-0
Risk of injury when entering or leaving the machine!
When entering or leaving the machine without a secure halt, you can slip and fall down.
- Do not jump up or down on the excavator.
- Always hold the hand rail tightly with one hand.
- Make sure that you have a secure footing.

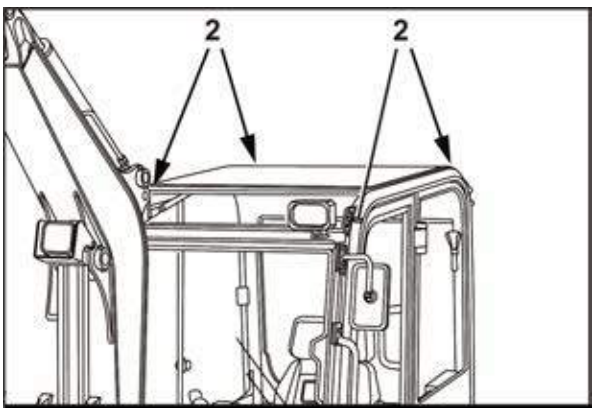
2) Code #: RG109-5796-0
Not an attachment point for lifting gear.

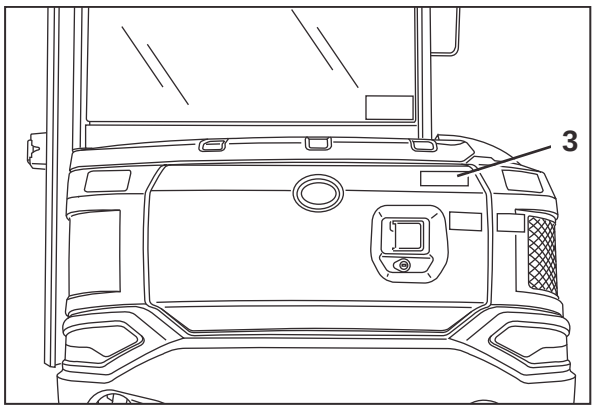


3) Code #: RG268-5738-0
Danger of cutting and crushing through rotating parts!
The rotating fans can cut into limbs and the rotating belt drive can pull in and crush limbs.
- Switch off the engine before working in the engine room.
- Ensure that the engine and all the engine parts have come to a complete standstill.
- Do not reach into rotating components.

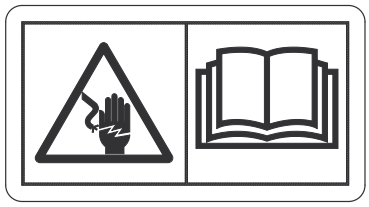








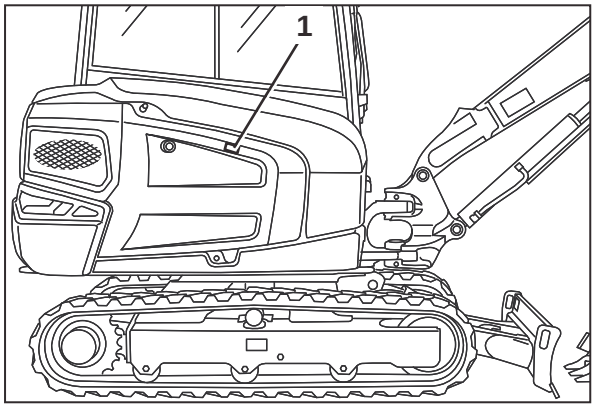
1) Code #: RG268-5786-0



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!



Safety devices

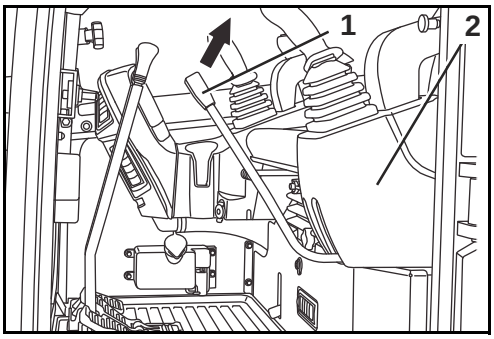
Before starting the machine, all safety devices must be installed properly and operational. Before starting the machine, all safety devices must be installed properly and operational. Manipulating the safety devices is prohibited.

Protective devices may only be removed once

- the excavator 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 (2) is raised completely with the control lever lock (1), then the hydraulic functions of the following controls will be locked:



Function	KX027-4 KX030-4	KX027-4 HI KX030-4 HI
Auxiliary port pedal	●	
Boom swing pedal	●	●
Drive lever	●	●
Dozer control lever	●	●
Right control lever	●	●
Left control lever	●	●

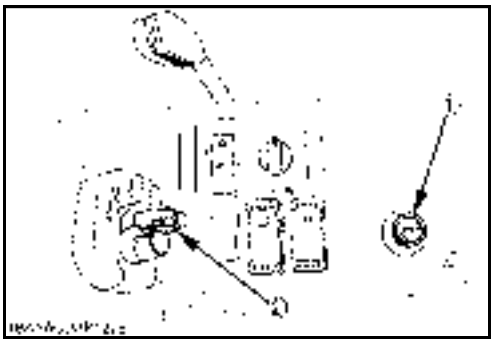
- To unlock the hydraulic functions, lower the control console completely using the control lever lock.

Engine stop knob

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

If the engine cannot be turned off, please operate the engine stop knob switch 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.

Protective structure canopy and cab

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

Canopy and cab were 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:

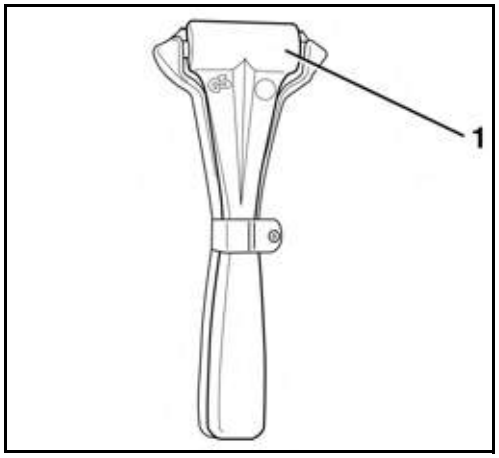
- The seat belt must be fastened while the excavator is being operated.
- Do not make any structural changes to the protective structure.
- In the event of damage, please contact your KUBOTA dealer. (Do not repair!)
- Never operate the excavator without the protective structure.

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 grid is required, a KUBOTA gravel guard (accessory) can be mounted.

Emergency hammer

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



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

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 excavator may not be placed 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.

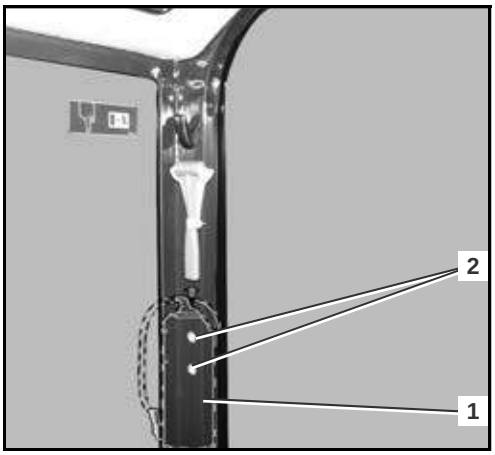
Leaking hydraulic oil must be bound immediately with an oil binding agent. The contaminated oil binding agent must be stored in suitable containers and in accordance with the valid regulations.

Fire protection

The excavator 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, muffler, exhaust manifold/tubes, etc. If the machine is being used at full capacity, cleaning 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. Any defective parts should be replaced immediately in order to avoid leaks.
- 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 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.
- For the attachment of a fire extinguisher (1), two threads (2) have been inserted in the cab construction on the left side behind 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 excavator, a towing vehicle of at least the same weight class as the excavator must be used.
- A tow bar must be used for the recovery. If a tow rope is used, an additional vehicle must also be attached to brake the excavator. The tow bar or tow rope must be suitable for the recovery of the excavator with regard to 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 excavator is used as the towing or recovery vehicle.
- Observe the admissible values for the towed load and the vertical load during recovery, see "Technical data" (page 39).

Safety rules while loading with a crane

- Crane and lifting gear must be suited for carrying the load to be lifted and be approved.
- 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 excavator may only be lifted at the provided attachment points. Do not attach the lifting gear to the cab roof as this can lead to substantial damage.
- Never attach a crane hook to the lower edge of the dozer! The crane hook can slip off sideways while lifting and the excavator may fall off.
- Always adhere to the valid safety regulations for the lifting of loads.
- The excavator must be secured with a holding rope when it is being lifted.
- The crane operator is responsible for the observance of these safety rules.

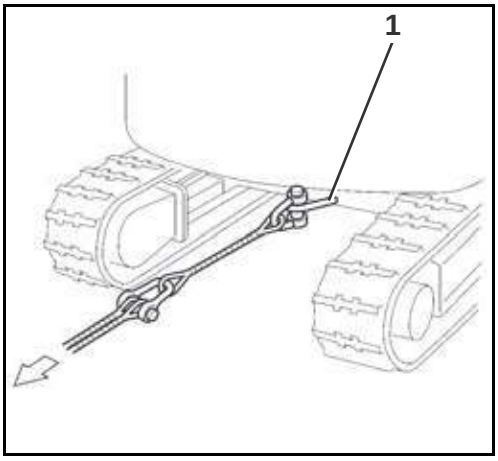
Safety rules for transport

- The ramps must have a sufficient load-bearing capacity for bearing the weight of the excavator. They must be placed securely on the transport vehicle and fastened.
- Support the loading area at the rear of the transport vehicle with sufficiently dimensioned supports.
- The ramps must be wider than the track of the excavator and have footboards on the sides.
- The transport vehicle must be designed for the load of the excavator.
- Position the left and the right ramp so that the centre line of the transport vehicle is aligned with the centre line of the excavator to be loaded.
- Do not drive the excavator onto the transport vehicle without ramps and with the boom.
- In the transport vehicle, pull the parking brake and secure the individual wheels of the transport vehicle both at the front and rear with chocks.
- Secure the excavator against sliding on the transport vehicle with chocks or chains or with suitable tie-down straps. The chocks must be secured at the crawlers and on the transport vehicle with suitable devices. The operator of the transport vehicle is responsible for securely fastening the excavator onto the vehicle.
- A guide is required for driving the excavator onto and off of the transport vehicle. The guide is responsible for the safe loading. The excavator may only be moved on instruction of the guide; the operator and guide must always maintain eye contact. If this is not possible, the operator must stop the excavator immediately.
- When driving with an excavator loaded, always keep a clearance of 1.0 m to overhead power lines. Observe the applicable traffic rules and regulations.

Recovery

Adhere to the "Safety rules" chapter (page 13) and the "Safety rules for recovery" section (page 31).

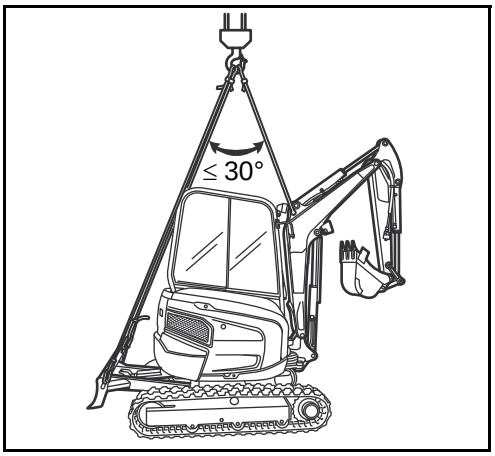
A recovery is only allowed over a short distance and at walking speed (0.5 m/s ~ 1.0 m/s).



- Attach the tow bar or tow rope to the attachment point (1) on the excavator and to the towing vehicle.
- If the attachment point of the excavator 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 excavator with a crane

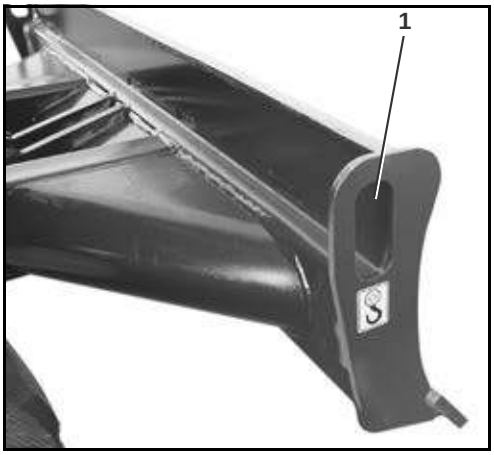
Adhere to the "Safety rules" chapter (page 13) and the "Safety rules for hoisting the excavator with a crane" section (page 31).



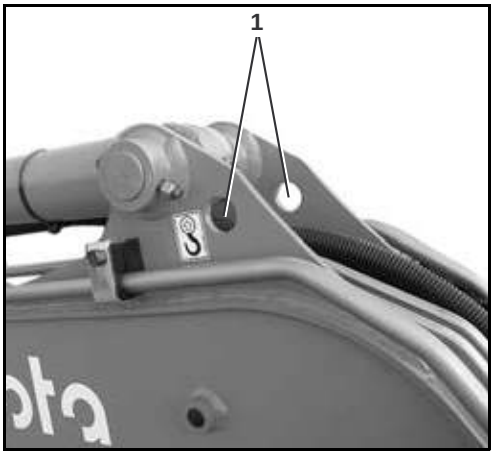
- Bring the excavator to the lifting position (see figure) on level ground.
- Lift the dozer until the dozer cylinders are fully retracted. Also see the "Operating the controls during excavation work" section (page 88).
- Bring the boom in line with the longitudinal axis of the swivel frame.
- Bucket cylinders and arm cylinders, respectively, must be extended to the stop position.
- Boom cylinders must be extended to the stop position.
- Rotate the swivel frame so that the dozer is located at the rear.
- Close and lock the door and covers.

The excavator may only be lifted at the provided attachment points. Do not attach the lifting gear to any other eyes or areas as this can lead to substantial damage.

- Attach the lifting gear with shackles to the lifting eyes (1) on each side of the dozer.



- Attach the lifting gear with shackles to the lifting eyes (1) on each side of the boom.



- As soon as the lifting gear is attached to the excavator, press towels between the lifting gear and the excavator to protect the excavator.
- 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 excavator and that the lifting angle is as specified. Lift the excavator.

Transport on a flat bed trailer

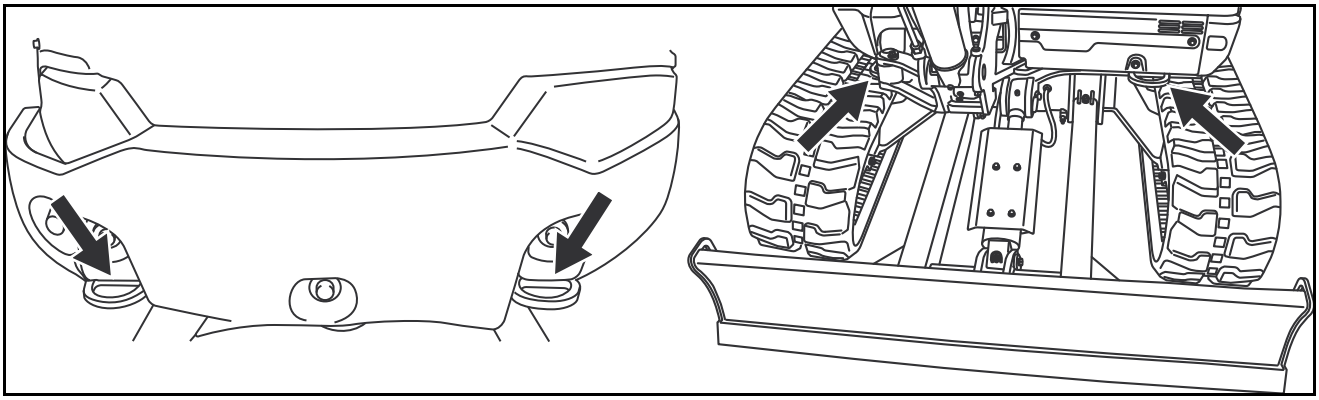
Adhere to the “Safety rules” chapter (page 13) and the “Safety rules for transport” section (page 32).

Do not turn or steer while driving up the ramps; if necessary, reverse the excavator and drive up again after realigning it.

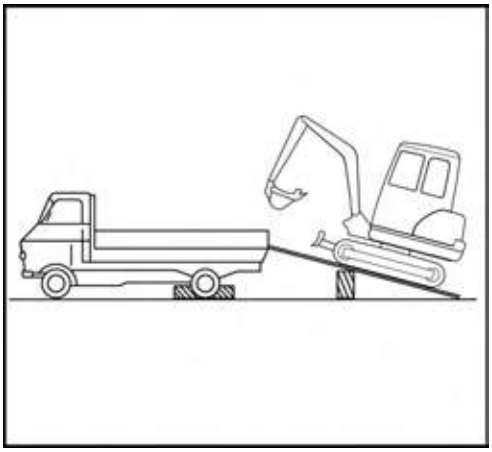
Caution! Danger!
Nobody is allowed to stand in the loading area during swivelling. Danger of crushing.

Take care during swivel operations. The front attachments could hit the transport vehicle. This could damage the transport vehicle and the excavator.

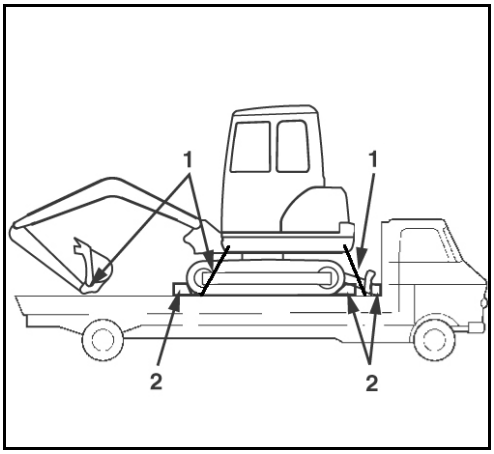
For securing the vehicle, tie down the points as shown in the figure.



- Place the loading ramps on the transport vehicle at an angle between 10° and 15°. Observe the track width.
- Safely attach the ramps to the transport vehicle to make sure they cannot slide while driving upwards.
- Bring the excavator exactly in line with the ramps and drive up straight. Lower the dozer onto the loading area.



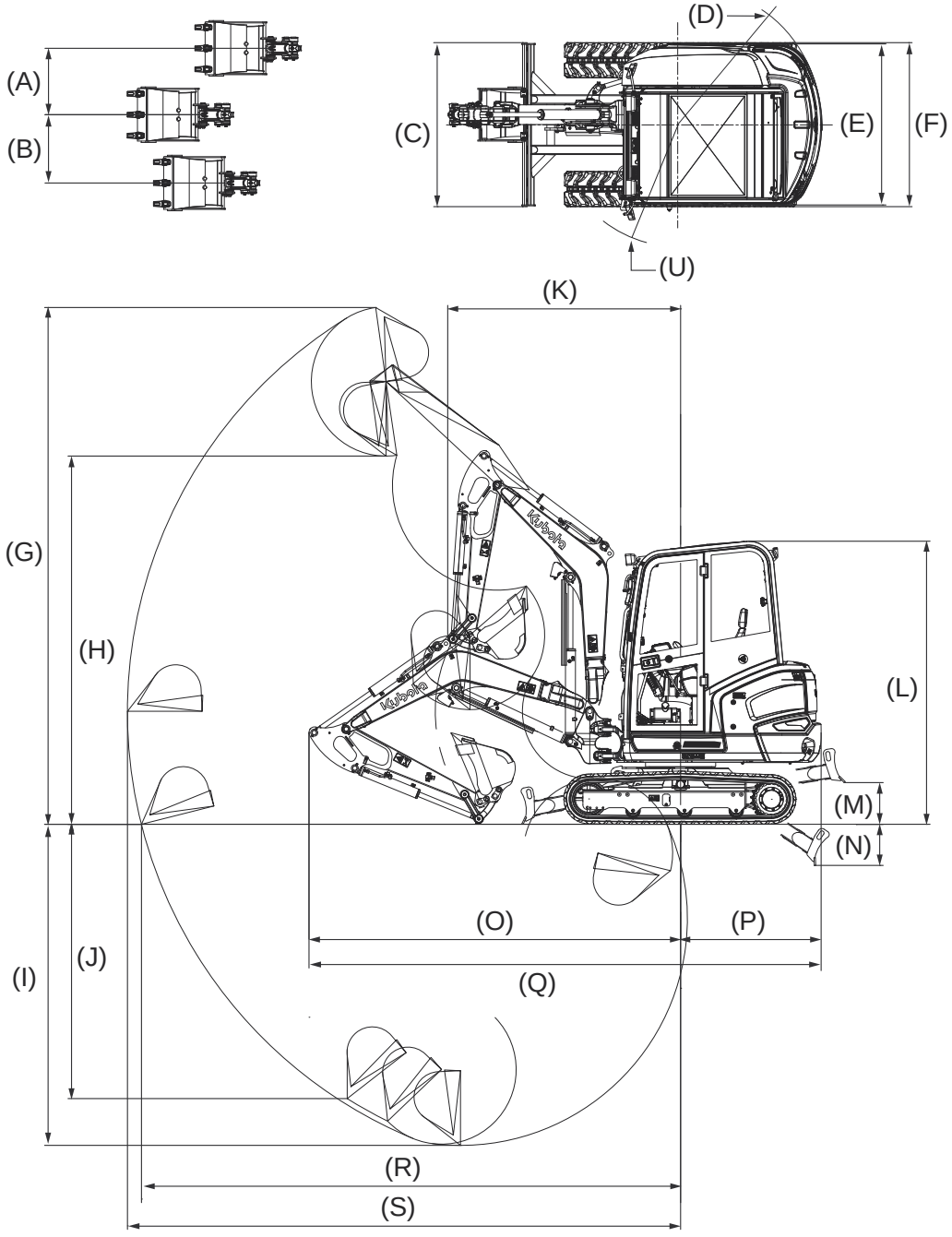
- Rotate swivel frame 180° until the front attachments face the rear of the transport vehicle.
- For safe attachment, fully retract the arm and bucket and lower the boom until the bucket linkages touch the loading area.
- Secure the chains and the dozer with wooden beams (2).
- Secure the excavator against sliding on the transport vehicle using suitable chocks or chains (1). Note the machine weight (page 39).
- Lock the excavator after hoisting.



DESCRIPTION OF THE EXCAVATOR

Dimensions

The dimensions of the models KX027-4 and KX030-4 can be found in the following figures and tables.



Canopy

KX027-4	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	U
1*	570	580	1400	1200	1380	1400	4420	2970	2490	2100	1943	2420	360	350	3140	1200	4340	4360	4480	860
3*	570	580	1400	1200	1380	1400	4410	3140	2740	2340	1990	2420	360	350	3170	1200	4370	4600	4720	860

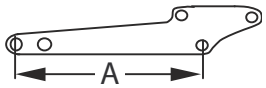
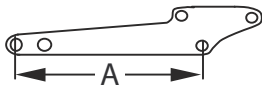
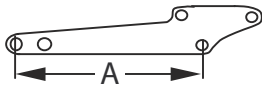
KX030-4	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	U
2*	570	580	1500	1200	1380	1500	4430	3110	2670	2260	1920	2420	350	350	3350	1200	4550	4570	4690	860
3*	570	580	1500	1200	1380	1500	4560	3240	2870	2460	1950	2420	350	350	3370	1200	4570	4760	4880	860

Cab

KX027-4	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	U
1*	570	580	1400	1200	1380	1400	4420	2970	2490	2100	1943	2420	360	350	3140	1200	4340	4360	4480	930
3*	570	580	1400	1200	1380	1400	4410	3140	2740	2340	1990	2420	360	350	3170	1200	4370	4600	4720	930

KX030-4	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	U
2*	570	580	1500	1200	1380	1500	4430	3110	2670	2260	1920	2420	350	350	3350	1200	4550	4570	4690	930
3*	570	580	1500	1200	1380	1500	4560	3240	2870	2460	1950	2420	350	350	3370	1200	4570	4760	4880	930

Arm version

*	Name	Type	
1	Arm 1050 mm		A = 1050 mm
2	Arm 1100 mm		A = 1100 mm
3	Arm 1300 mm		A = 1300 mm

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

Specifications

				KUBOTA Excavator	
Model name				KX027-4	
Type				Canopy	
				Rubber crawler	Steel crawler
Machine weight*			kg	2520	2635
Operating weight**			kg	2595	2710
Bucket		Capacity (CECE)	m^3	0.060	
		Width with teeth (without teeth)	mm	500 (450)	
Engine		Type		Water-cooled four-cylinder diesel engine	
		Model name		V1505-E4-BH-2EU	
		Displacement	cm^3	1498	
		Engine performance (ISO 9249)	kW	17.5	
		Rated speed	1/min	2250	
		CO_2 emission*** (Engine family HKBXL01.5BCB)	g/kWh	1018.0	
Performance		Swivel speed Swivel frame	1/min	9.8	
		Vehicle speed	Travel speed km/h	4.6	
			Low speed km/h	2.7	
		Ground pressure (without operator)	kPa (kgf/cm^2)	24.0 (0.24)	25.1 (0.25)
		Climbing performance	% (degrees)	36 (20)	
		Max. lateral sway	% (degrees)	27 (15)	
Dozer		width x height	mm	1400 x 300	
Swing angle of the boom		Left	rad (degrees)	1.34 (77)	
		Right	rad (degrees)	0.99 (57)	
Auxiliary port connector 1		Max. flow rate (theoretical)	l/min	47.3	
		Max. pressure	MPa (bar)	22.5 (225)	
Auxiliary port connector 2****		Max. flow rate (theoretical)	l/min	18.0	
		Max. pressure	MPa (bar)	17.2 (172)	
Fuel tank capacity			l	48	
Pulling capacity at the towing eyes			N	70500	
Vertical load at the towing eyes			N	7200	
Noise level		LpA	dB (A)	76.5	
		LwA (2000/14/EC)	dB (A)	93	
Vibration*****	Hand arm system (ISO 5349-2:2001)	Digging	m/s^2 RMS	< 2.5	
		Levelling	m/s^2 RMS	< 2.5	
		Driving	m/s^2 RMS	< 2.5	
		Idling	m/s^2 RMS	< 2.5	
	Whole body (ISO 2631-1:1997)	Digging	m/s^2 RMS	< 0.5	
		Levelling	m/s^2 RMS	< 0.5	
		Driving	m/s^2 RMS	< 0.5	
		Idling	m/s^2 RMS	< 0.5	

* Prepared for operation with Original-KUBOTA-Löffel 55 kg.

** Machine weight, incl. operator 75 kg.

*** The CO_2 measurement is based on the check carried out for an engine representative of the engine family, using a designated check cycle under laboratory conditions. The specifications do not implicate or guarantee the performance of a given engine.

**** Only for equipment variant KX027-4 HI.

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

				KUBOTA Excavator	
Model name				KX027-4	
Type				Cab	
				Rubber crawler	Steel crawler
Machine weight*			kg	2590	2705
Operating weight**			kg	2665	2780
Bucket	Capacity (CECE)		m³	0.060	
	Width with teeth (without teeth)		mm	500 (450)	
Engine	Type			Water-cooled four-cylinder diesel engine	
	Model name			V1505-E4-BH-2EU	
	Displacement		cm³	1498	
	Engine performance (ISO 9249)		kW	17.5	
	Rated speed		1/min	2250	
	CO_2 emission*** (Engine family HKBXL01.5BCB)		g/kWh	1018.0	
Performance	Swivel speed Swivel frame		1/min	9.8	
	Vehicle speed	Travel speed	km/h	4.6	
		Low speed	km/h	2.7	
	Ground pressure (without operator)		kPa (kgf/cm²)	24.7 (0.25)	25.8 (0.26)
	Climbing performance		% (degrees)	36 (20)	
	Max. lateral sway		% (degrees)	27 (15)	
Dozer	width x height		mm	1400 x 300	
Swing angle of the boom	Left		rad (degrees)	1.34 (77)	
	Right		rad (degrees)	0.99 (57)	
Auxiliary port connector 1	Max. flow rate (theoretical)		l/min	47.3	
	Max. pressure		MPa (bar)	22.5 (225)	
Auxiliary port connector 2****	Max. flow rate (theoretical)		l/min	18.0	
	Max. pressure		MPa (bar)	17.2 (172)	
Fuel tank capacity			l	48	
Pulling capacity at the towing eyes			N	70500	
Vertical load at the towing eyes			N	7200	
Noise level	LpA		dB (A)	76.5	
	LwA (2000/14/EC)		dB (A)	93	
Vibration*****	Hand arm system (ISO 5349-2:2001)	Digging	m/s² RMS	< 2.5	
		Levelling	m/s² RMS	< 2.5	
		Driving	m/s² RMS	< 2.5	
		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	< 0.5	
		Idling	m/s² RMS	< 0.5	

* Prepared for operation with Original-KUBOTA-Löffel 55 kg.

** Machine weight, incl. operator 75 kg.

*** The CO_2 measurement is based on the check carried out for an engine representative of the engine family, using a designated check cycle under laboratory conditions. The specifications do not implicate or guarantee the performance of a given engine.

**** Only for equipment variant KX027-4 HI.

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

				KUBOTA Excavator	
Model name				KX030-4	
Type				Canopy	
				Rubber crawler	Steel crawler
Machine weight*			kg	2720	2825
Operating weight**			kg	2795	2900
Bucket		Capacity (CECE)	m^3	0,059	
		Width with teeth (without teeth)	mm	505 (480)	
Engine		Type		Water-cooled four-cylinder diesel engine	
		Model name		V1505-E4-BH-3EU	
		Displacement	cm^3	1498	
		Engine performance (ISO 9249)	kW	17,7	
		Rated speed	1/min	2250	
		CO_2 emission*** (Engine family HKBXL01.5BCB)	g/kWh	1018.0	
Performance		Swivel speed Swivel frame	1/min	9,5	
		Vehicle speed	Travel speed km/h	4,5	
			Low speed km/h	2,9	
		Ground pressure (without operator)	kPa (kgf/cm^2)	25,9 (0,26)	26,9 (0,27)
		Climbing performance	% (degrees)	36 (20)	
		Max. lateral sway	% (degrees)	27 (15)	
Dozer		width x height	mm	1500 x 300	
Swing angle of the boom		Left	rad (degrees)	1,34 (77)	
		Right	rad (degrees)	0,99 (57)	
Auxiliary port connector 1		Max. flow rate (theoretical)	l/min	49,5	
		Max. pressure	MPa (bar)	23,5 (235)	
Auxiliary port connector 2****		Max. flow rate (theoretical)	l/min	18,0	
		Max. pressure	MPa (bar)	19,6 (196)	
Fuel tank capacity			l	48	
Pulling capacity at the towing eyes			N	70500	
Vertical load at the towing eyes			N	7200	
Noise level		LpA	dB (A)	76.5	
		LwA (2000/14/EC)	dB (A)	93	
Vibration*****	Hand arm system (ISO 5349-2:2001)	Digging	m/s^2 RMS	< 2.5	
		Levelling	m/s^2 RMS	< 2.5	
		Driving	m/s^2 RMS	< 2.5	
		Idling	m/s^2 RMS	< 2.5	
	Whole body (ISO 2631-1:1997)	Digging	m/s^2 RMS	< 0.5	
		Levelling	m/s^2 RMS	< 0.5	
		Driving	m/s^2 RMS	< 0.5	
		Idling	m/s^2 RMS	< 0.5	

* Prepared for operation with Original-KUBOTA-Löffel 65 kg.
** Machine weight, incl. operator 75 kg.
*** The CO_2 measurement is based on the check carried out for an engine representative of the engine family, using a designated check cycle under laboratory conditions. The specifications do not implicate or guarantee the performance of a given engine.
**** Only for equipment variant KX030-4 HI.
***** These values are measured under specific conditions at maximum engine speed and can deviate, depending on the operating situation.

				KUBOTA Excavator	
Model name				KX030-4	
Type				Cab	
				Rubber crawler	Steel crawler
Machine weight*			kg	2790	2895
Operating weight**			kg	2865	2970
Bucket		Capacity (CECE)	m³	0,059	
		Width with teeth (without teeth)	mm	505 (480)	
Engine		Type		Water-cooled four-cylinder diesel engine	
		Model name		V1505-E4-BH-3EU	
		Displacement	cm³	1498	
		Engine performance (ISO 9249)	kW	17,7	
		Rated speed	1/min	2250	
		CO_2 emission*** (Engine family HKBXL01.5BCB)	g/kWh	1018.0	
Performance		Swivel speed Swivel frame	1/min	9,5	
		Vehicle speed	Travel speed km/h	4,5	
			Low speed km/h	2,9	
		Ground pressure (without operator)	kPa (kgf/cm²)	26,6 (0,27)	27,6 (0,28)
		Climbing performance	% (degrees)	36 (20)	
		Max. lateral sway	% (degrees)	27 (15)	
Dozer		width x height	mm	1500 x 300	
Swing angle of the boom		Left	rad (degrees)	1,34 (77)	
		Right	rad (degrees)	0,99 (57)	
Auxiliary port connector 1		Max. flow rate (theoretical)	l/min	49,5	
		Max. pressure	MPa (bar)	23,5 (235)	
Auxiliary port connector 2****		Max. flow rate (theoretical)	l/min	18,0	
		Max. pressure	MPa (bar)	19,6 (196)	
Fuel tank capacity			l	48	
Pulling capacity at the towing eyes			N	70500	
Vertical load at the towing eyes			N	7200	
Noise level		LpA	dB (A)	76.5	
		LwA (2000/14/EC)	dB (A)	93	
Vibration*****	Hand arm system (ISO 5349-2:2001)	Digging	m/s² RMS	< 2.5	
		Levelling	m/s² RMS	< 2.5	
		Driving	m/s² RMS	< 2.5	
		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	< 0.5	
		Idling	m/s² RMS	< 0.5	

* Prepared for operation with Original-KUBOTA-Löffel 65 kg.

** Machine weight, incl. operator 75 kg.

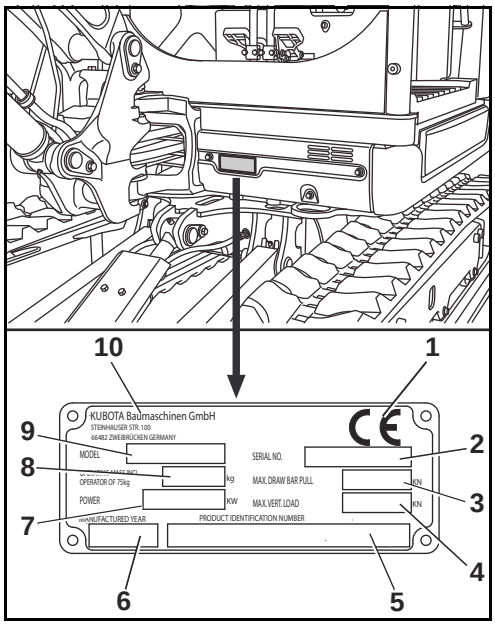
*** The CO_2 measurement is based on the check carried out for an engine representative of the engine family, using a designated check cycle under laboratory conditions. The specifications do not implicate or guarantee the performance of a given engine.

**** Only for equipment variant KX030-4 HI.

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

Identification of the excavator

The type plate of the excavator 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.



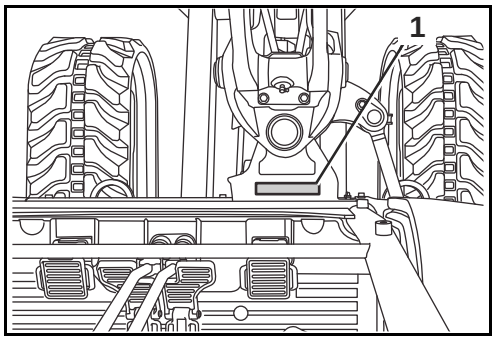
1. CE label
2. Serial #
3. Max. pulling capacity at the towing eyes
4. Max. vertical load at the towing eyes
5. Product ID number PIN
6. Year of construction
7. Engine performance
8. Operating weight
9. Model name
10. Manufacturer

The product ID number PIN (5) can be used to identify the standard equipment KX027-4 and KX030-4 or the equipment variants KX027-4 HI and KX030-4 HI:

Product ID number PIN	
KX027-4	WKF RGJ11 00Z0
KX027-4 HI	WKF RGJ15 00Z0
KX030-4	WKF RGN11 00Z0
KX030-4 HI	WKF RGN15 00Z0

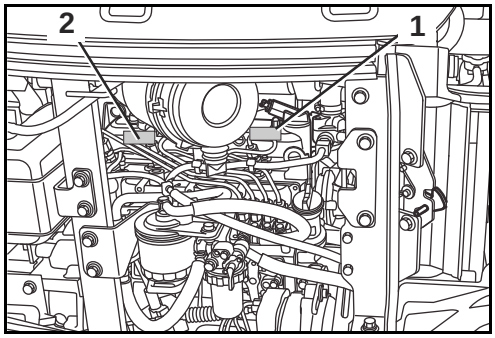
Serial # of the machine

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



Identification of the engine

The engine can be identified based on the engine number and the numbers for the engine family and engine type.
The numbers are affixed to the engine's valve cover:



1. Engine number
2. Engine family and engine type

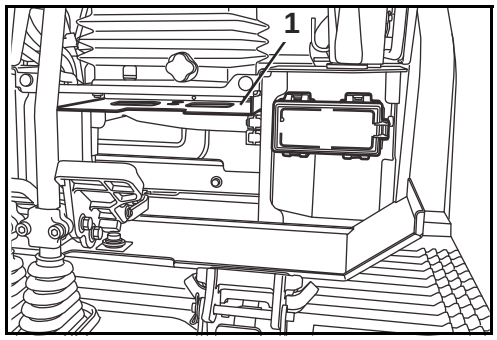
Standard equipment

This model includes the following standard equipment:

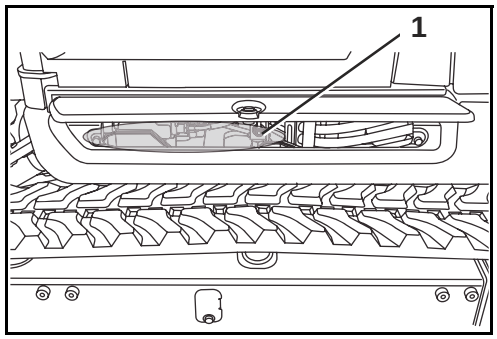
- Operating instructions
- Spare parts catalogue
- Protective cover
- Filter wrench
- Spare fuse (2x50 A)
- Guarantee

Spare parts catalogue and guarantee can be kept together with the operating instructions(page 11).

The filter wrench must be stowed in the tool compartment (1) below the seat.

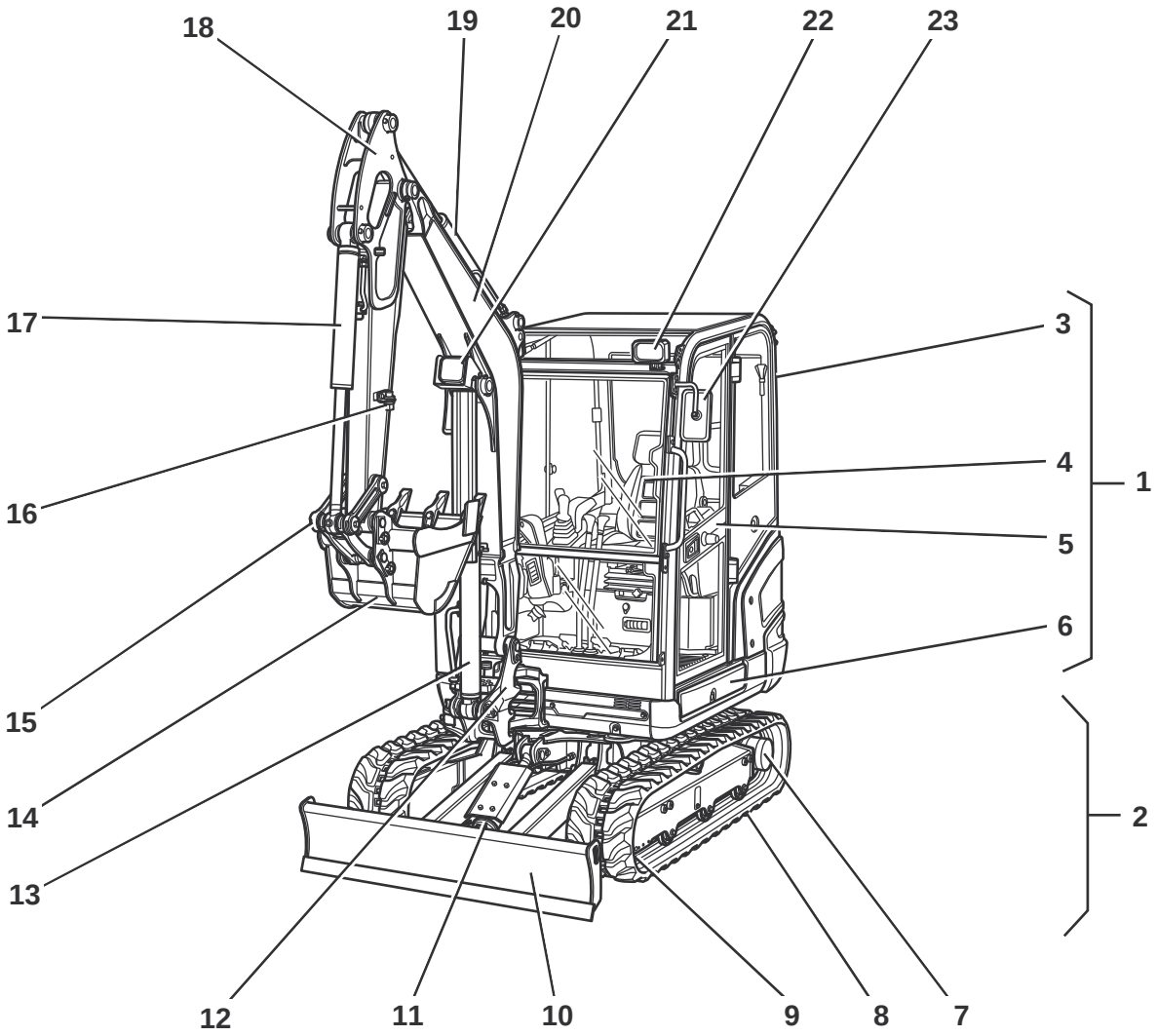


A grease gun can be stowed in the repository (1) behind the left service cover on the swivel frame.



ASSEMBLY AND FUNCTIONS

Component overview

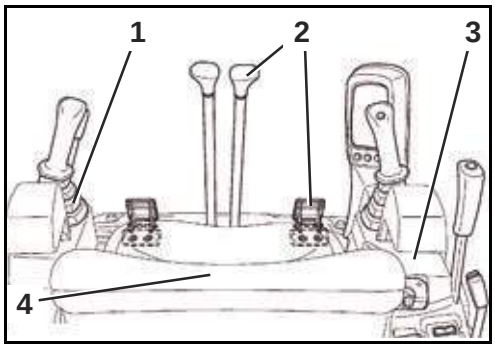


1. Swivel frame
2. Track frame
3. Cab
4. Operator's place
5. Cab door
6. Left service cover
7. Drive sprocket
8. Crawler
9. Idler
10. Dozer
11. Dozer cylinder
12. Swing block
13. Boom cylinder
14. Bucket
15. Bucket linkage
16. Auxiliary port connectors
17. Bucket cylinder
18. Arm
19. Arm cylinder
20.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

Operator's place

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

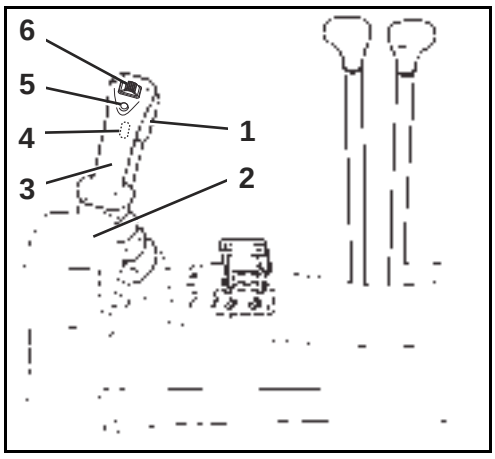
1. Left control console
2. Drive levers and control pedals
3. Right control console
4. Operator's seat



Left control console

The left control console includes the following components:

1. Control lever lock
2. Wrist rest
3. Left control lever
4. Reserve button (KX027-4 HI, KX030-4 HI)
5. Reserve button (KX027-4 HI, KX030-4 HI)
6. Rocker switch for auxiliary port 2 (KX027-4 HI, KX030-4 HI)



Description of the components of the left control console

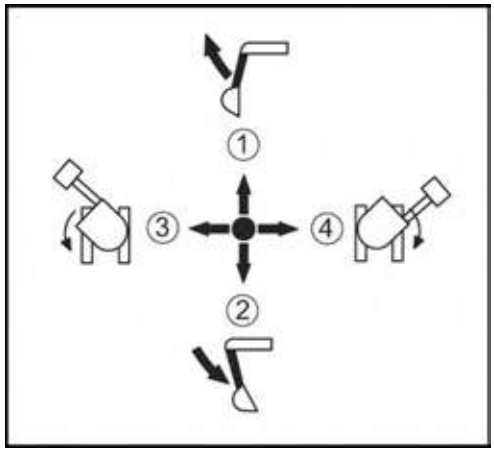
1. Control lever lock
To enter and leave the cab, the console must be raised by pulling up the control lever lock. The engine can only be started if the console is raised. The control levers, the drive levers, the boom swing pedal, and the dozer control lever are only operational when the console is lowered and the control lever lock is in the "down" position.

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

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. Reserve button (KX027-4 HI, KX030-4 HI)

This button does not have a function, but can however be activated in order to control other accessories.

5. Reserve button (KX027-4 HI, KX030-4 HI)

This button does not have a function, but can however be activated in order to control other accessories.

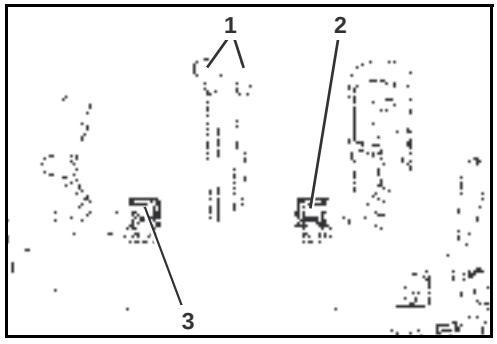
6. Rocker switch for auxiliary port 2 (KX027-4 HI, KX030-4 HI)

The rocker switch for auxiliary port 2 controls the oil flow to auxiliary port 2. Auxiliary port 2 can be controlled proportionally (infinitely variable)

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. Auxiliary port pedal (KX027-4, KX030-4)



Drive levers and control pedals – description

1. Left and right drive levers

With the drive levers the excavator 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

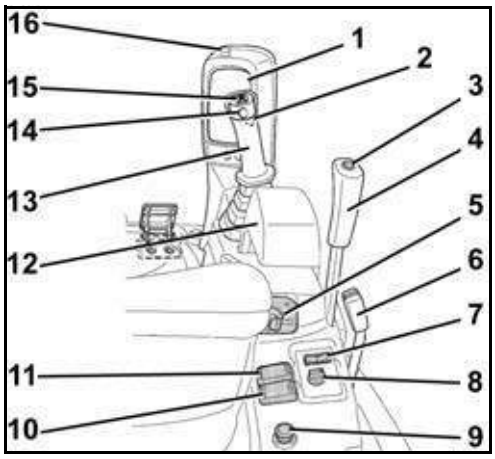
This pedal is used to swing the boom right and left.

3. Auxiliary port pedal (KX027-4, KX030-4)

The auxiliary port pedal can be used to operate an attachment.

Right control console

The right-hand control console contains the following components:



1. Display and control unit
2. One way hold switch (KX027-4 HI, KX030-4 HI)
3. Travel speed button
4. Dozer control lever
5. Starter switch
6. Throttle lever
7. Wiper/washer switch (cab version)
8. Blower switch (cab version)
9. Engine stop knob
10. Rotary beacon button
11. Working light button
12. Wrist rest
13. Right control lever
14. Horn switch
15. Rocker switch for auxiliary port 1 (KX027-4 HI, KX030-4 HI)
16. Potentiometer for auxiliary port 2 (KX027-4 HI, KX030-4 HI)

Description of the components of the right control console

1. Display and control unit
The functions of the display and control unit are described in the "Display and control unit - description" section (page 51).

2. One way hold switch (KX027-4 HI, KX030-4 HI)
Actuating the one way hold switch activates a continuous oil flow to auxiliary port connector 1 on the left-hand side 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.

3. Travel speed button
The travel speed button switches the travel speed mode on and off.

4. 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.

5. Starter switch
The starter switch serves as the master switch for the entire machine and as the switch for pre-glowing and starting the engine.

6. Throttle lever
Using the throttle lever, the operator can adjust the engine speed in an infinitely variable manner.

7. Wiper/washer switch (cab version)
The wiper/washer switch switches on the wiper for the front window and/or the washer system.

8. Blower switch (cab version)
The fan is switched on with the blower switch. The air flow can be set to HIGH (HI) or LOW (LO).

9. Engine stop knob
Using this device, the operator can switch off the engine manually.

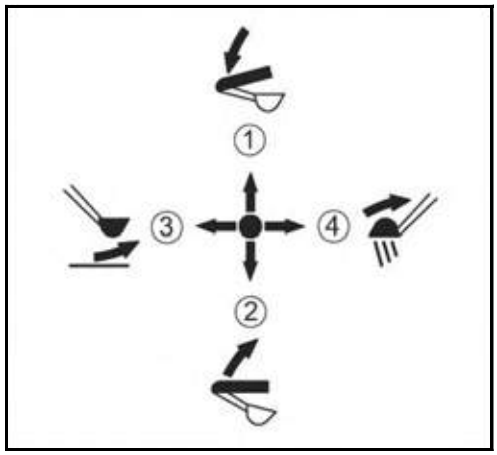
10. Rotary beacon button
This switch activates and deactivates the rotary beacon (accessory).

11. Working light button
Switches the working lights on or off.

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

13. 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

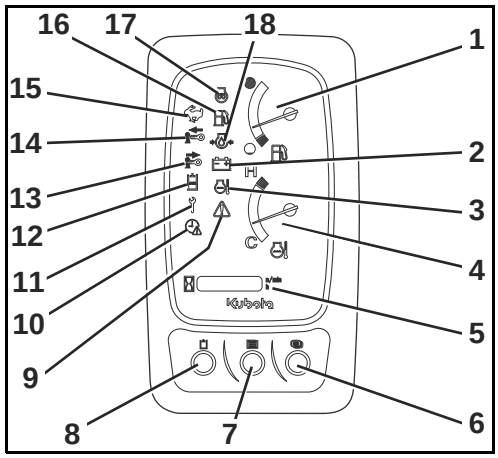
14. Horn switch
Depressing the horn switch activates the horn.

15. Rocker switch for auxiliary port 1 (KX027-4 HI, KX030-4 HI)
The rocker switch for auxiliary port 1 controls the oil flow to auxiliary port connector 1. Auxiliary port 1 can be controlled proportionally (infinitely variable).

16. Potentiometer for auxiliary port 2 (KX027-4 HI, KX030-4 HI)
The potentiometer can be used to variably adjust the flow rate on auxiliary port 2 as desired.

Display and control unit

The display and control unit contains the following displays, buttons and indicators:



1. Fuel gauge
2. Charge indicator
3. Coolant temperature indicator
4. Coolant temperature gauge
5. Display
6. Display selector switch
7. Menu button
8. Auxiliary port switch (KX027-4 HI, KX030-4 HI)
9. Warning light
10. Set clock indicator
11. Servicing indicator
12. Auxiliary port indicator 1 (KX027-4 HI, KX030-4 HI)
13. Pull out key indicator
14. Insert key indicator
15. Travel speed indicator
16. Fuel stock indicator
17. Pre-glowing indicator
18. Engine oil pressure indicator

The display and control unit's buttons are multifunctional and are also used to navigate the display menu. You will find detailed descriptions of the individual functions in the respective chapters.

Display and control unit - description

1. **Fuel gauge**
   The fuel gauge indicates the relative amount of fuel in the tank.

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

3. **Coolant temperature indicator**
   The coolant temperature indicator lights up if the temperature in the cooling circuit is elevated.

4. **Coolant temperature gauge**
   The coolant temperature gauge indicates the temperature in the cooling circuit of the engine.

5. **Display**
   The display can indicate time, engine speed, hours of operation and encoded system information.

6. **Display selector switch**
   The display selector switch changes what is shown on the display.

7. **Menu button**
   The menu button is used to switch the menu guide on the display on or off.

8. **Auxiliary port switch (KX027-4 HI, KX030-4 HI)**
   The auxiliary port switch can be used to enable the hydraulic functions for the auxiliary ports and to switch between operating modes on auxiliary port 1.

9. **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.

10. **Set clock indicator**
    If the clock needs adjustment (e.g. after disconnecting the battery for servicing purposes), the set clock indicator will flash.

11. **Servicing indicator**
    The maintenance indicator lights up when a service period is due.

12. **Auxiliary port indicator 1 (KX027-4 HI, KX030-4 HI)**
    Depending on the operating mode, auxiliary port indicator 1 lights up or flashes if auxiliary port function 1 is switched on.

13. **Pull out key indicator**
    The pull out key indicator lights up if the ignition key should be pulled out.

14. **Insert key indicator**
    The insert key indicator lights up if the ignition key should to be inserted.

15. **Travel speed indicator**
    The travel speed indicator lights up when the travel speed mode is activated.

16. **Fuel stock indicator**
    The fuel level indicator lights up in the event of low fuel and requests refuelling.

17. Pre-glowing indicator
The pre-glowing indicator lights up when switching the starter switch to the RUN position. When the indicator goes off, it is possible to start the engine.

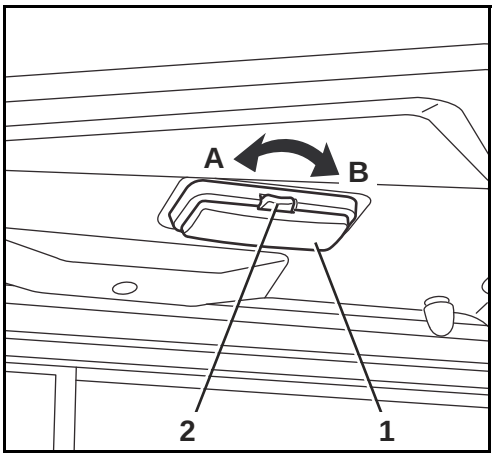
18. Engine oil pressure indicator
The engine oil pressure indicator lights up when the oil pressure is below the reference value.

Other equipment at the operator's place

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

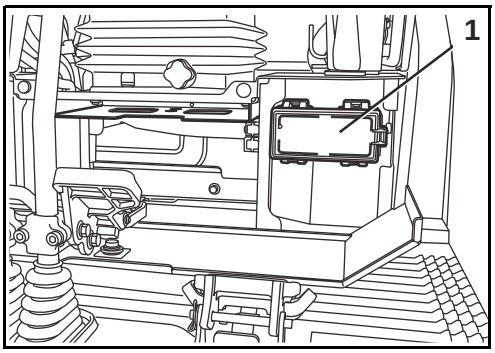
Interior lighting (cab version)

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



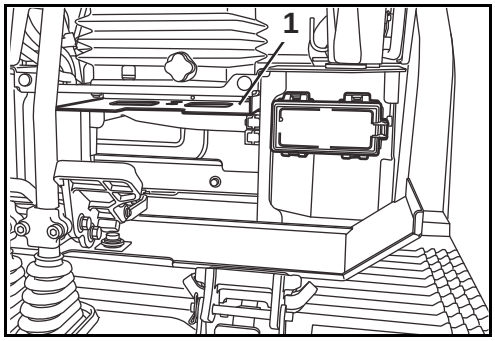
Fuse box

The fuse box (1) is located below the operator's seat behind a cover.



Tool compartment

The tool compartment (1) is located below the operator's seat behind a cover plate.

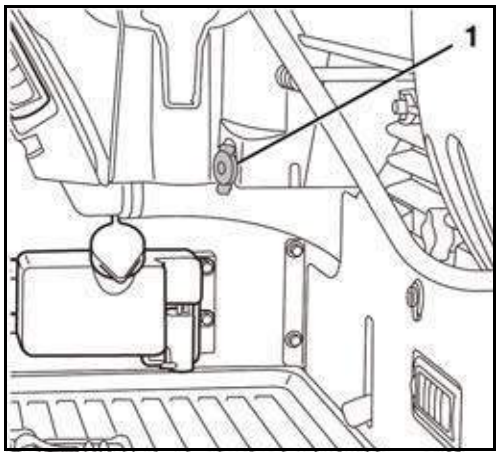


Cup holder

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

12-V socket

A 12-V electrical outlet (1) is located on the right-hand control console for the purpose of connecting an external electric device.

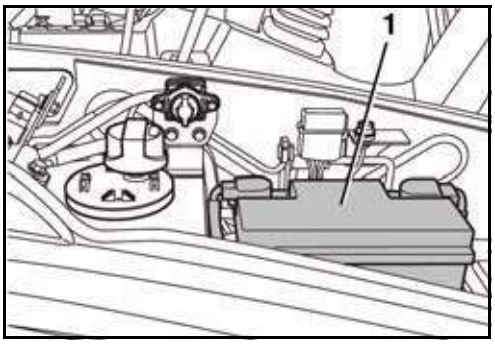


Other equipment to be found on the machine

Other equipment located on and around the machine is described below.

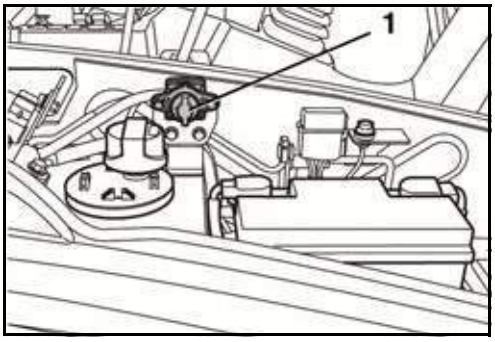
Main battery

The main battery (1) is located on the right 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.

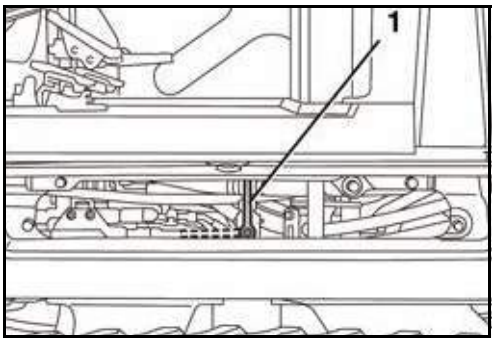


Return change valve for direct return flow

Depending on 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 change valve for direct return flow (1) is used to toggle the setting between "indirect return flow" and "direct return flow".

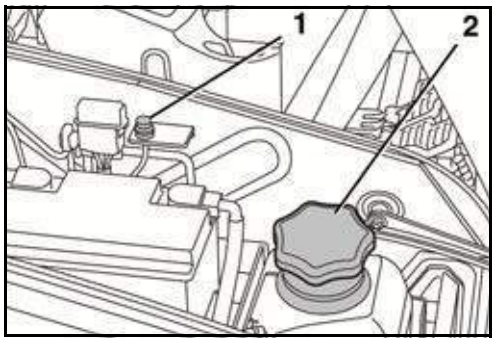
The return change valve for direct return flow is located behind the left service cover on the swivel frame.



Tank filler neck and fill level monitor

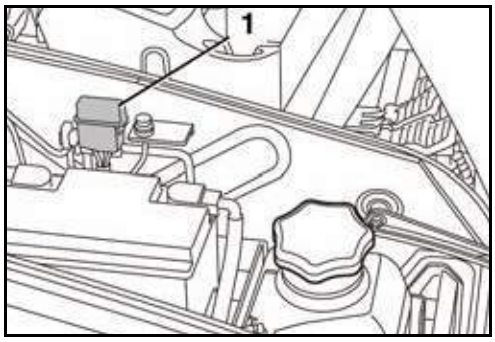
The tank filler neck (2) is located under the side cover on the right of the machine.

The fill level monitor (1) is located to the left of the tank filler neck and it indicates the fuel level when refuelling.



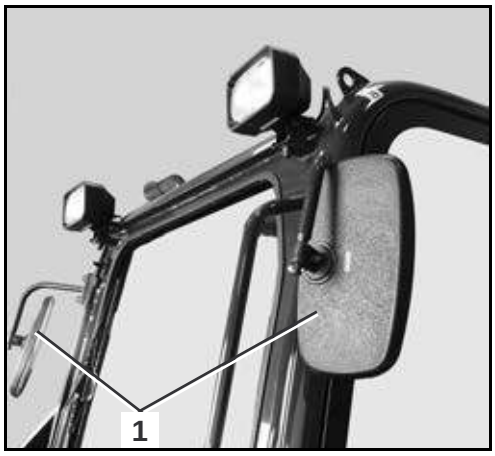
Main fuses

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



Rear view mirror

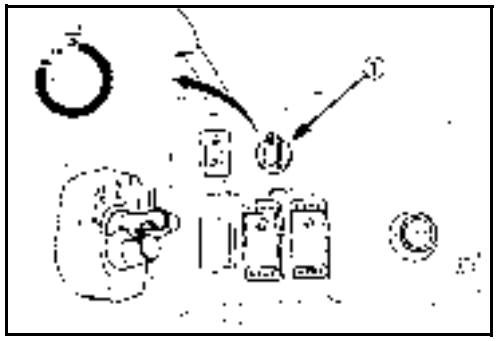
The rear-view mirrors (1) allow the operator to see behind the vehicle. The rear-view mirrors can be adjusted for optimum visibility of the respective areas.



Heating and ventilation (cab version)

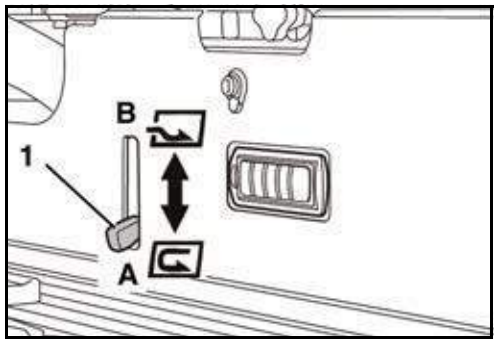
Turning on and switching off of the heater fan and the air volume control is via the blower switch (1) on the right control console.

Using the blower switch, air volume can be adjusted at two levels LO and HI, where level HI stands for max. blower output.

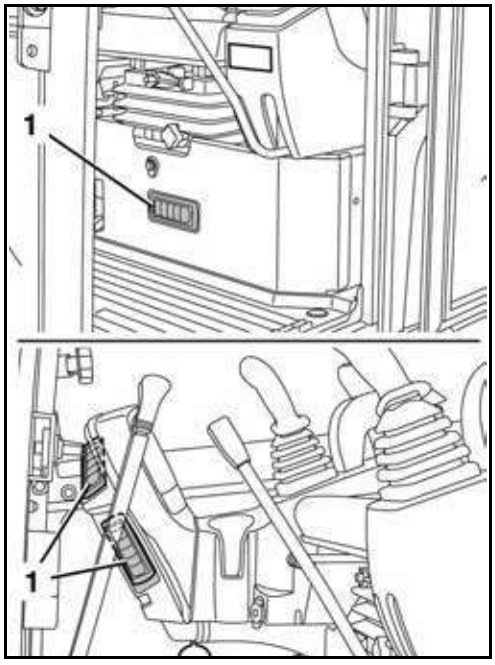


The air is drawn in as fresh air from the right cab wall or recirculates within the cab.

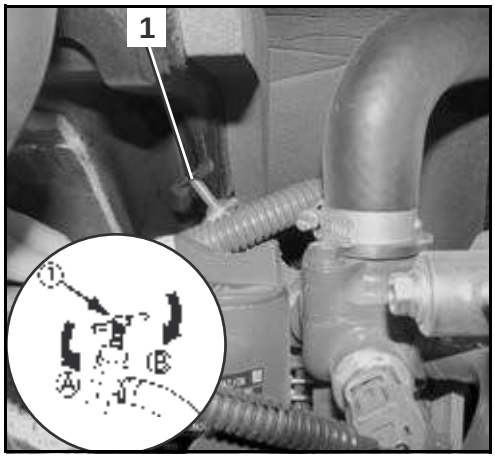
With the lever (1) the air intake can be switched between recirculated air (A) and fresh air (B).



The air is guided to the air nozzles (1) via the heat exchanger.



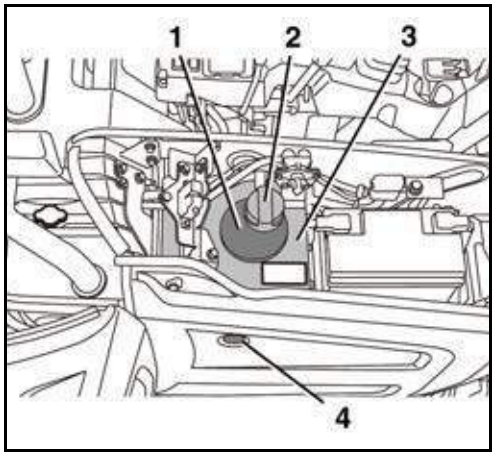
The heater valve (1) in the engine compartment regulates the supply of hot water to the heat exchanger from the cooling cycle.



Hydraulic oil tank

The hydraulic oil tank contains the suction filter and the return filter.

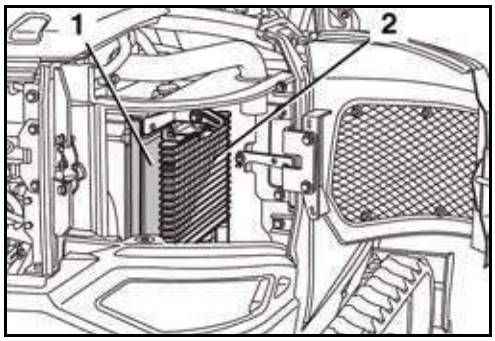
1. Oil fill opening for hydraulic oil
2. Breather filter
3. Hydraulic oil tank
4. Sight glass for hydraulic oil level



Coolant radiator and hydraulic oil radiator

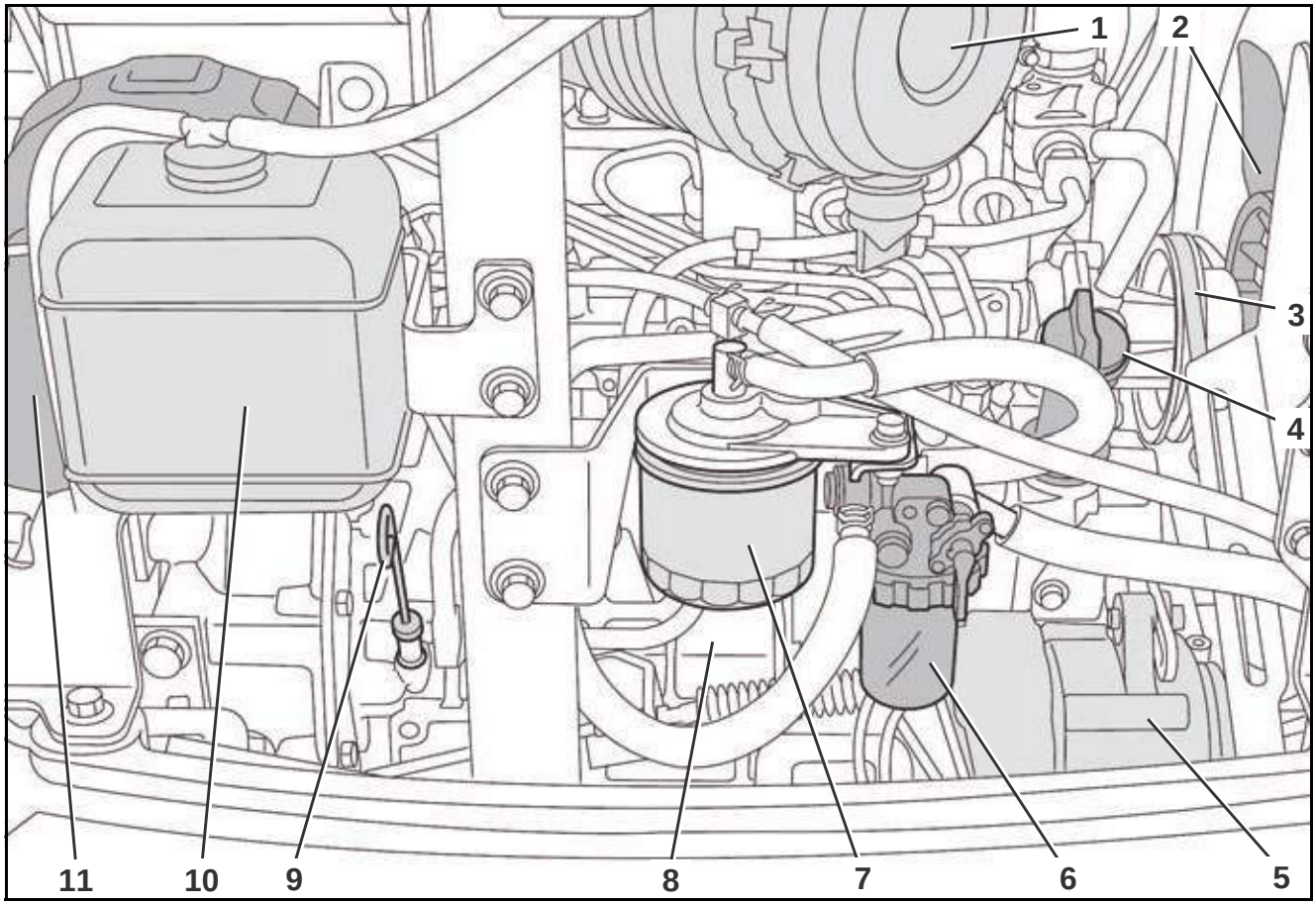
To the rear of the right ventilation grille at the rear of the excavator, are the coolant radiator and hydraulic oil radiator.

1. Coolant radiator
2. Hydraulic oil radiator



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. Air filter
2. Cooling fan
3. V-belt
4. Oil filler opening
5. Alternator
6. Water separator
7. Fuel filter
8. Engine
9. Oil dipstick
10. Muffler
11. Coolant expansion reservoir

OPERATION

Safety rules for operation

- The safety instructions (page 13) must be followed.
- The excavator may only be operated in accordance with the “Approved use” section (page 15).
- The machine may only be operated by instructed or trained personnel (page 10).
- Do not operate the excavator when under the influence of drugs, medication or alcohol. Stop operation when getting tired. The operator must be physically capable of operating the excavator safely.
- The excavator should only be operated if all protective devices are fully operational.
- Before starting or working with the excavator, make sure that there is no danger for any person nearby.
- Before starting the excavator, it must be checked for external damage and operability, and the pre-start checks must be carried out. If defects are detected, the excavator should only be taken into operation after the defects have been repaired.
- Wear tight-fitting working clothes in accordance with the trade association regulations.
- During the operation of the excavator, nobody except the operator is allowed to be inside the cab or get on the excavator.
- 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 excavator (e.g. for breaks or at the end of work), the engine must be stopped and the excavator must be secured against restarting by removing the key. The cab door must be locked. Before leaving the excavator, 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 excavator before the engine is stopped, the key is removed and the excavator is secured against moving.
- Never crawl under the excavator 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 bulldozer blade onto the ground. The dozer may only be used if the dozer cylinder is equipped with a pipe safety valve.

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.
- Before leaving the machine, park it so that it cannot move. When leaving the machine (e.g. for breaks or at the end of work), stop the engine, remove the key and close the cab door, if present.

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 excavator immediately if eye contact with the guide is interrupted.
  → As a rule, either the excavator or the guide may move, never both at once!

Working in the vicinity of overhead power lines

When working with the excavator in the vicinity of overhead power lines and tram lines, a minimum distance as specified in the following table must be maintained between the excavator and its attachments and the power line.

Rated voltage [V]		Safe distance [m]
	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 excavator must be taken into consideration.

Unevenness of the ground or sloping the excavator 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 excavator, 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 excavator or the person responsible for the work must check if there are any underground power lines in the proposed working area.

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 excavator must first be checked visually for external transit damages and checked if the shipped equipment is complete as ordered.

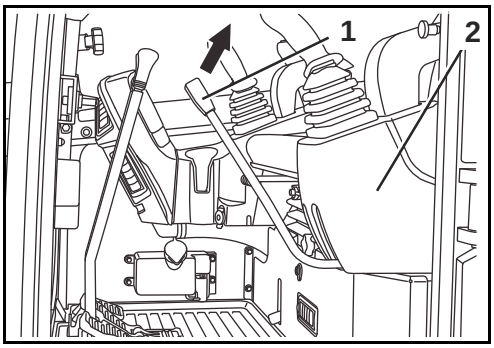
- Check fluid levels as described in the "Maintenance" section (page 135).
- For a description of all operating features, refer to the "Operating the excavator" section (page 77) as well as the following sections.

If defects are detected, please inform your dealer immediately.

Getting on the excavator

Risk of injury when entering or leaving the machine!
When entering or leaving the machine without a secure halt, you can slip and fall down.
- *Do not jump onto or off of the excavator*
- *Always hold the hand rail tightly with one hand*
- *Pay attention to stepping safely*

- 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 into the excavator, use the chain as a stepping aid.
- Sit down on the operator's seat.

Explanation of the display indications

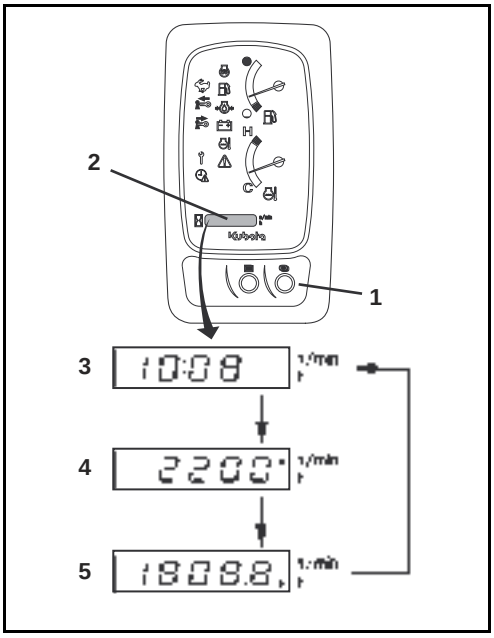
If the starter switch is switched to the RUN position, the time (3), the engine speed (4) and the hours of operation (5) can be indicated on the display (2).

For the selection of the display indication, press the display selector switch (1) until the desired indicator appears on the display.

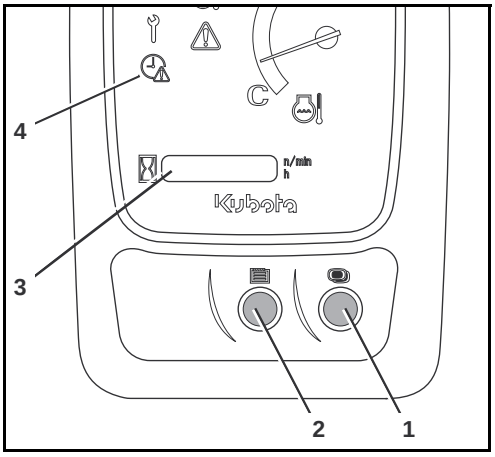
The following function can be carried out when the key is not in the starter switch.

- Press the display selector switch (1).

On the display, the hours of operation are indicated for about 10 seconds.



Setting the clock



- Turn the starter switch to the RUN position.
- Press menu button (2).
- Press display selector switch (1) until the clock is selected on the display (3).

By pressing and holding of the display selector switch (1) the following are selected in this order: year, month, day, 12 or 24 hour indicator, hours and minutes for adjusting.

- Press display selector switch (1) and hold down.

When carrying out the setting process, the value to be adjusted will flash on the display and the indicator (4) on the display and control unit.

- Press menu button (2) to reduce the numerical value.
- Press display selector switch (1) to increase the numerical value.
- To store the setting of the clock and to finish, press the display selector switch (1) once more and hold it down.

If the battery is separated from the electricity network, the clock settings are deleted. After recommissioning the indicator, "Set clock" blinks and requests the renewed setting of the clock.

Running in the excavator

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

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

Special maintenance instructions

Damage to equipment due to contaminated grease!
The grease plays a particular and important role in the running-in of the excavator. 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.

Pre-operational services

For the performance of the services, the excavator must be parked on level ground. The engine must be turned off. The left control console must be raised.

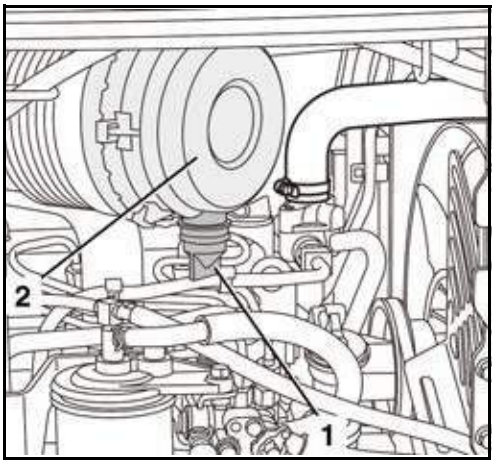
- Open the engine compartment cover (page 144). Close engine compartment cover after completion of the activities.
- Open the side cover (page 144). Always close the side cover after the work is done.
- Open the right ventilation grille (page 145). Close the ventilation grille after completing the tasks.

Walk-around inspection

- Check the excavator for visible damage, loose nuts and screws, and leaks.
- Check for any accumulated dirt adjacent to hot components, e.g. engine, muffler, exhaust manifold/tubes and remove if necessary.
- Check for accumulated residues from leaves, straw, pine needles, twigs, bark and other flammable materials and remove if necessary.
- Check the danger, warning and safety labels on the machine. They must be complete and legible (page 17).
- Ensure that the emergency hammer is present for the cab version (page 28).

Dust valve - cleaning

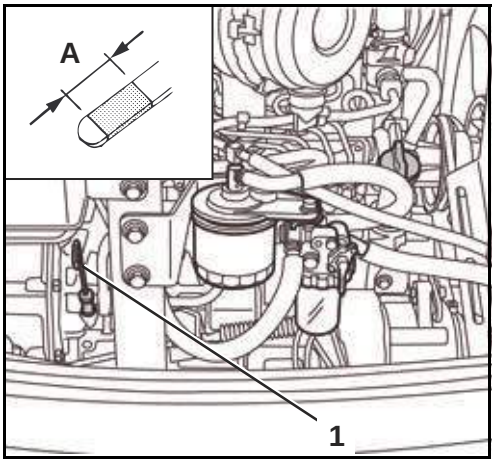
- Empty the dust valve (1) on the air filter cover (2) by pressing it together several times.
- If it is very dirty, remove the air filter and clean it (page 154).



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, add engine oil (page 158).

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



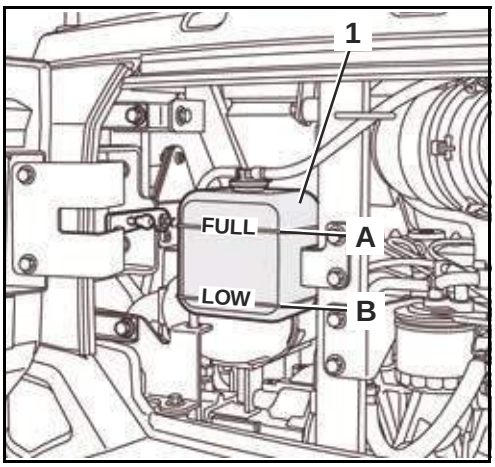
Coolant level - check

- Check the level of the coolant in the expansion tank (1).

The fluid level must be between FULL (A) and LOW (B).

If the coolant level is below the LOW mark, refill coolant (page 117).

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

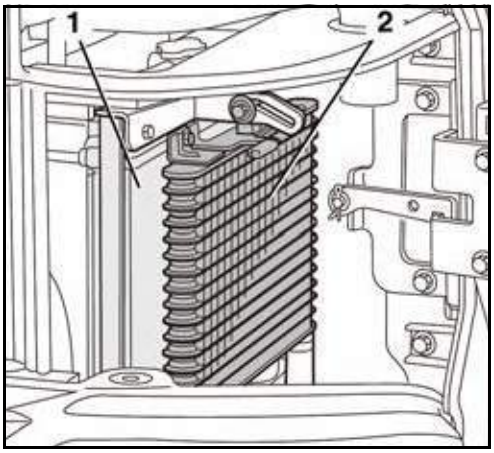


Coolant radiator and oil cooler - check

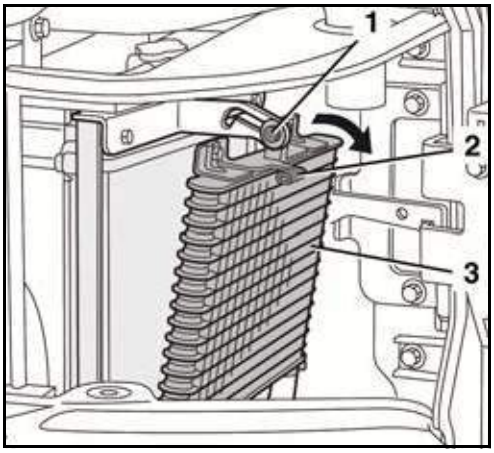
- Walk-around inspection of coolant radiator (1) and oil cooler (2) for tightness and dirt.

If there is any dirt etc. on the radiators:

- Clean coolant radiator (1) and hydraulic oil radiators (2) from the engine with a water jet or a compressed air gun. Do not use high-pressure cleaners.



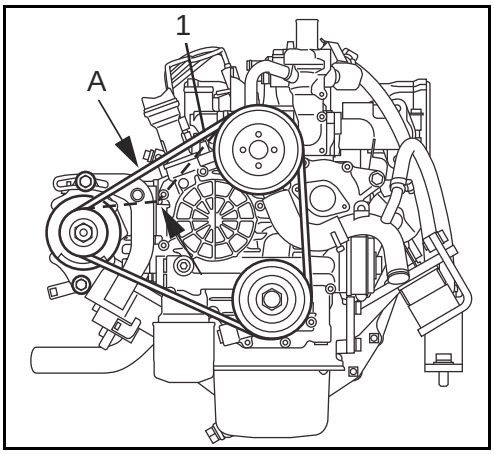
- Remove the screw (1) and pull on the handle (2) of the oil cooler (3) to fold it away from the coolant radiator.
- Particular care must be devoted to the space between the radiators because foliage often collects at this point.
- After cleaning, check coolant radiator and hydraulic oil radiator for damage.
- Finally, fold the oil cooler (3) back and tighten the screw (1).



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. 7-9 mm (pressure: 6-7 kg). Adjust the V-belts if necessary (page 156).
- Check condition of the V-belt, it must not have any cracks or other damage. Replace the V-belts if necessary.



Exhaust system leakage - check

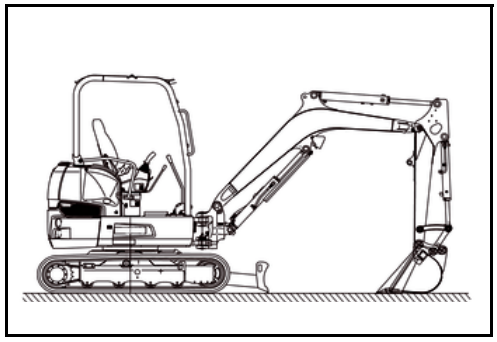
- Check the exhaust system for leaks and tightness (formation of cracks).

If the inspection is carried out when the engine is warm, there is a risk of burns in the exhaust system.

- If the exhaust system is leaky or loose, the excavator may only be taken into operation after the defects are eliminated.

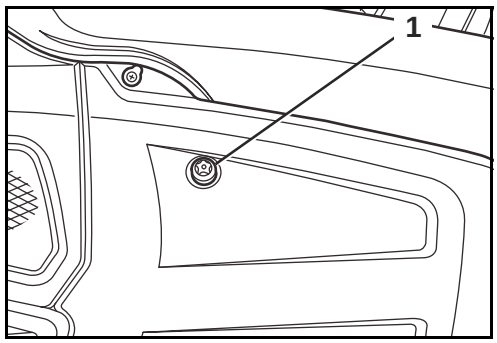
Hydraulic oil level - check

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 are extended halfway.
– Boom swing mechanism is in the centre position.
– Dozer is lowered to the ground.

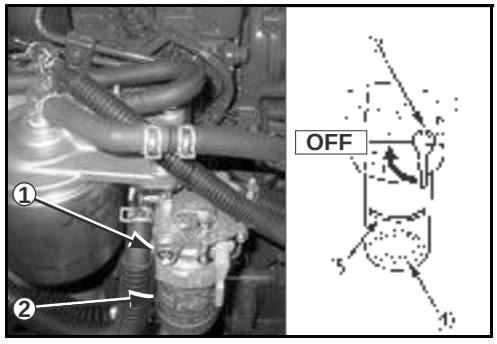
- Check the oil level in the sight glass (1).



The oil level should be 1/2 to 3/4 of the way up the sight glass. Carefully check the position of the hydraulic cylinders again before topping up the oil.

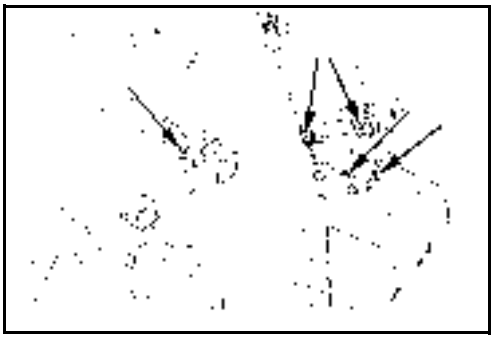
Water separator - check

A red plastic ring in the water separator (1) floats up with the water level. If the ring is floating up, clean the water separator (page 154).



Bucket bolt and bucket linkage bolt - grease

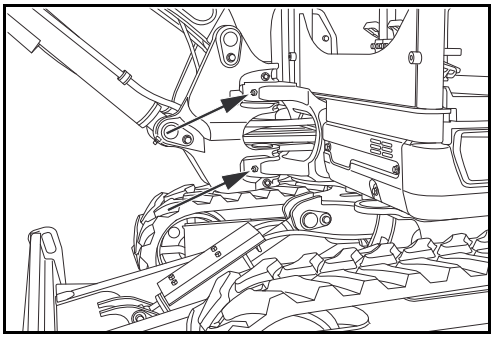
- Start the engine (page 77).
- Position arm and bucket as shown in the figure.
- Stop the engine (page 79).
- Lubricate all greasing points (see figure to the right) – see the "Recommended lubricants" section (page 142) – by applying grease until fresh grease emerges.



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

Swing bracket - grease

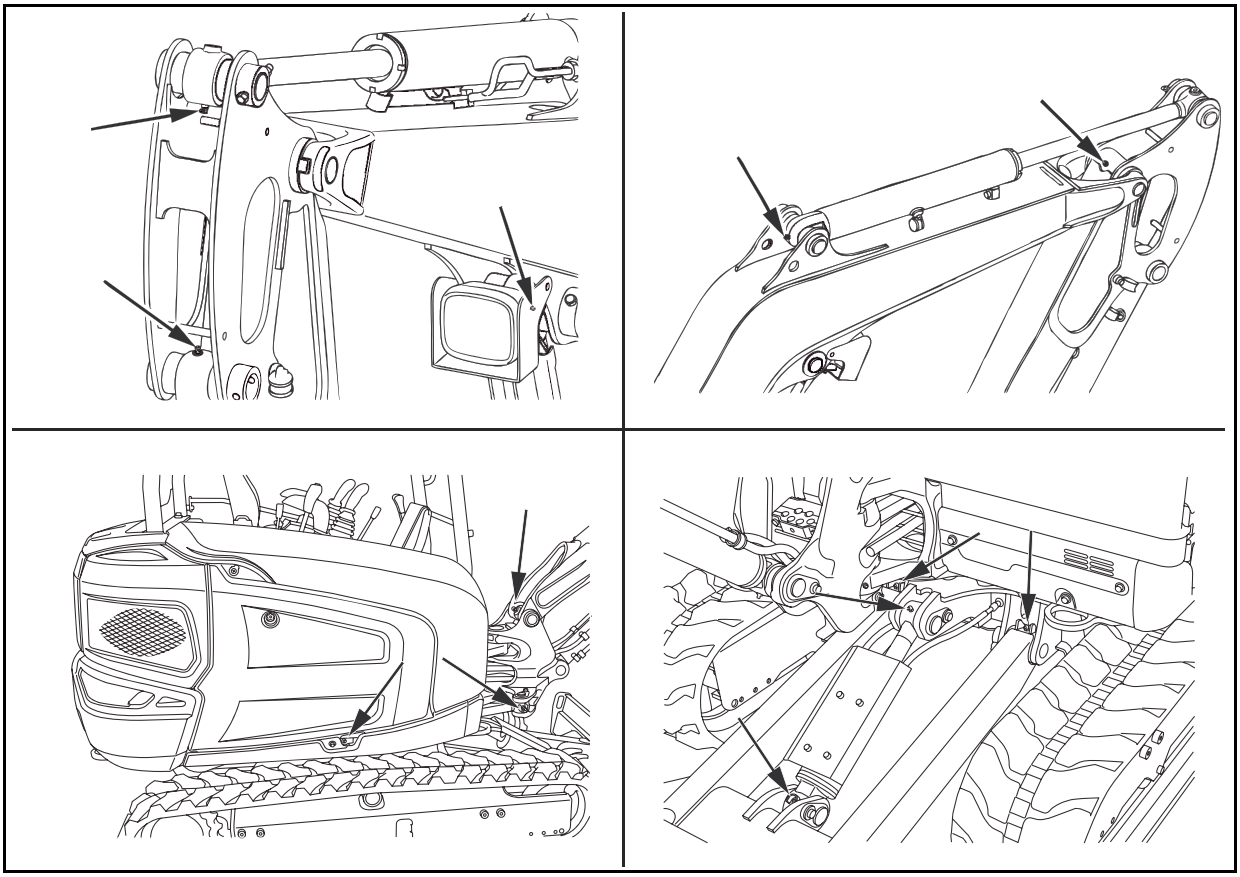
- Lubricate both greasing points (see figure to the right) – see the "Recommended lubricants" section (page 142) – by applying grease until fresh grease emerges.



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

Other greasing points - grease

- Start the engine (page 77).
- Lower the bucket and the dozer onto the ground. Stop the engine, remove the key. Refer to the "Operating the controls during excavation work" section (page 88).

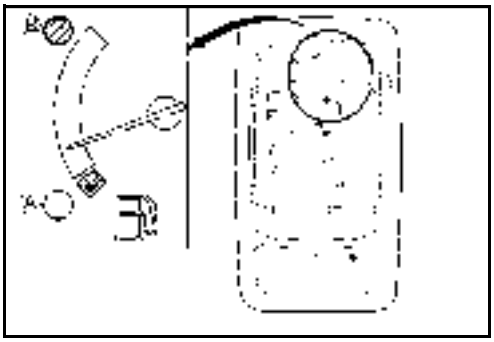


- Lubricate all greasing points with grease – see the "Recommended lubricants" section (page 142) – until fresh grease emerges.

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

Fuel level - check

The fuel gauge (1) indicates the relative amount of fuel in the tank. The less fuel that is left in the fuel tank, the lower the needle of the gauge.

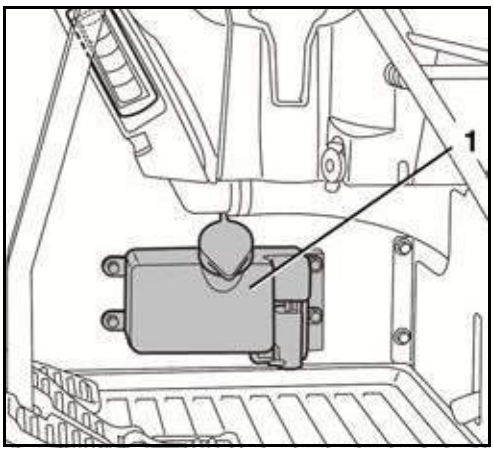


- Turn the starter switch to the RUN position.
- Check fuel situation by looking at the fuel gauge on the display and control unit.
- Refuel excavator if there is too little fuel left (page 118).

Ensure that the fuel tank is not running on empty. Otherwise, air will get into the fuel system. The fuel system must then be bled.

Washer system liquid level (cab version) - check

Do not operate the washer system if its reservoir (1) is empty as running dry could damage the pump.



- Check whether the liquid reservoir is full enough.

If the filling capacity is too low, fill washer system reservoir (page 116).

Electrical instrumentation - check

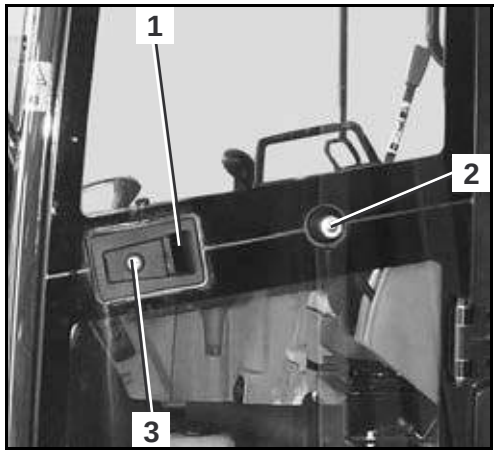
- Check the function of the interior light (page 111).
- Check the function of the working light (page 112).
- Check the function of the rotary beacon (accessories) (page 111).
- Check the function of the ventilation fan. For the subsequent heating operation, ensure that the heater valve is open in the engine compartment (page 108).
- Check the function of the washer system (page 110).
- 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.

Setting up the workplace

Opening and closing the cab door (cab version)

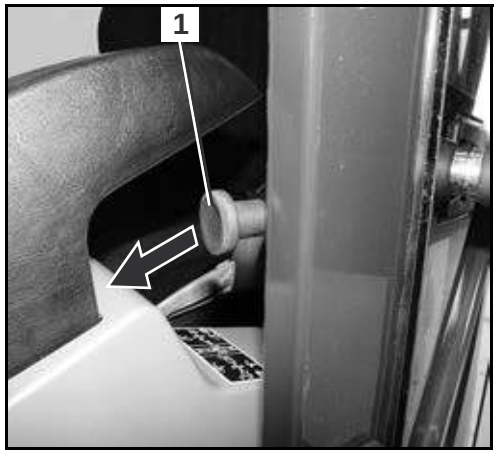
Opening the cab door from outside

- Unlock the cab door at the door lock (3).
- Open the cab door by pulling at the door handle (1) and lock the door by attaching the hook (2) at the cab wall.



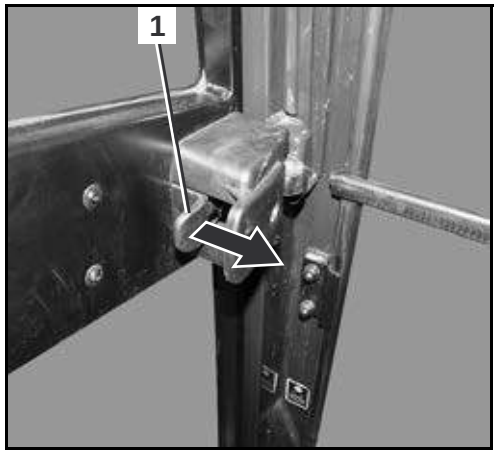
Closing the cab door

- Pull out release lever (1) and pull cab door shut until it latches.



Opening the cab door from the inside

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

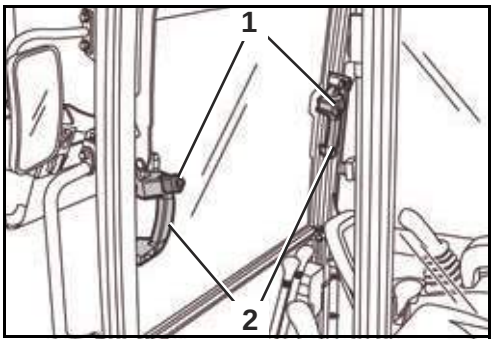


Opening and closing the windows (cab version)

Front window

Always lock the front window. Do not stay in the cab and operate the excavator 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.

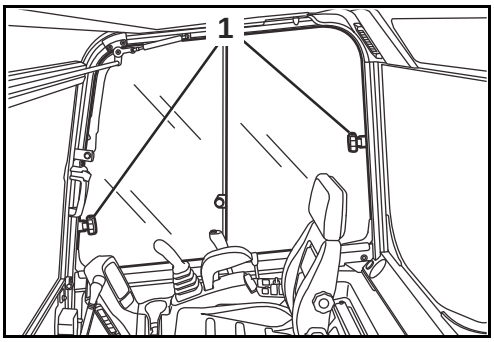
Closing

- 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.

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.

The front side window cannot be opened when the rear side window is completely open.

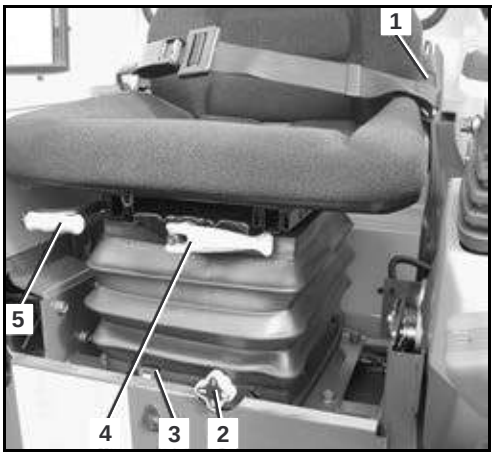


Adjusting the operator's seat

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.

Spring adjustment (operator's weight)

- The seat can be set to the weight of the operator using the toggle (figure above, position/4). Refer to the weight indicator (figure above, position/3) when choosing your setting.
- Turning the grip clockwise increases spring tension (heavier operator), turning the grip anticlockwise reduces spring tension (lighter operator).
- Adjust the seat so that a comfortable cushioning is achieved.

Seat height adjustment (knee height)

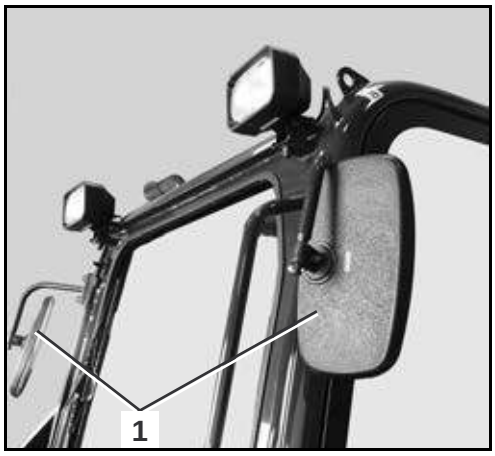
- To adjust the seat height, turn the rotary knob (figure above, position/2). The seat height depends on the setting of the level (0, I, II, III), where level 0 is the lowest option. Adjust the seat height in relation to its horizontal position so that the foot controls can be operated safely.

Backrest adjustment

- Take the load off the backrest and pull up the backrest adjustment lever (figure above, position/1). 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.

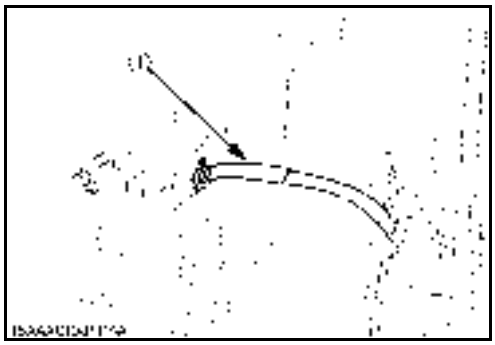
Rear view mirrors adjustment

Check that the rear-view mirrors (1) are positioned properly and, if necessary, adjust the mirrors until optimum visibility is ensured.



Seat belt

- Buckle up the seat belt (1).
- Check that the seat belt is fastened tightly.



STOP

Do not operate the excavator without the seat belt fastened.

Operating the excavator

To operate the excavator safely, see the following sections.

Safety instructions for starting the engine

The excavator is equipped with an anti-theft system (page 122).

When starting the excavator for the first time on a work day, carry out the pre-operational services (page 66).

The safety rules for operation (page 61) are to be observed by all means!

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

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

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

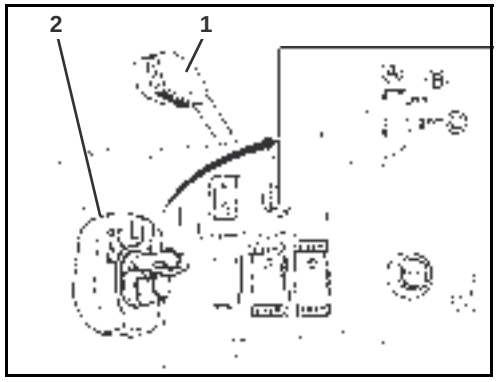
Before starting the engine, make the necessary operator station adjustments (page 73).

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 uncharged, jump-start the excavator (page 114).

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

Starting the engine

- Push throttle lever (1) in the following direction .
- Insert the key into the starter switch (2) and turn it to the RUN position.



The excavator is equipped with an anti-theft system. If the excavator is started with the wrong key, the indicator “Pull out key” (figure below/6) lights up on the display and control unit.

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 warning light (5) lights up yellow, the engine cannot be started.

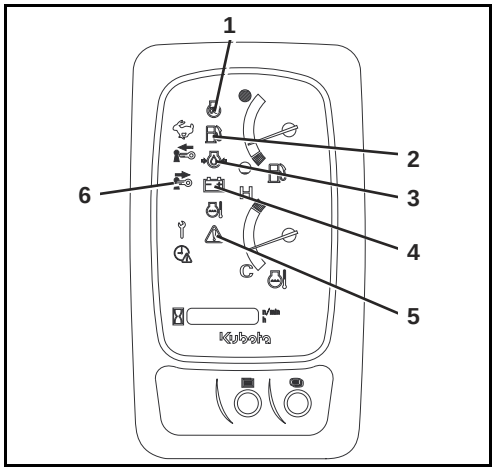
The pre-glowing indicator (1) lights up briefly. The engine can be started after it goes off.

The engine oil pressure indicator (3) lights up and goes out after the engine has been started.

The charge indicator (4) lights up and goes out after the engine has been started.

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

If the fuel reserve indicator (2) flashes yellow, there is only a little fuel left in the tank, refuel excavator (page 118).

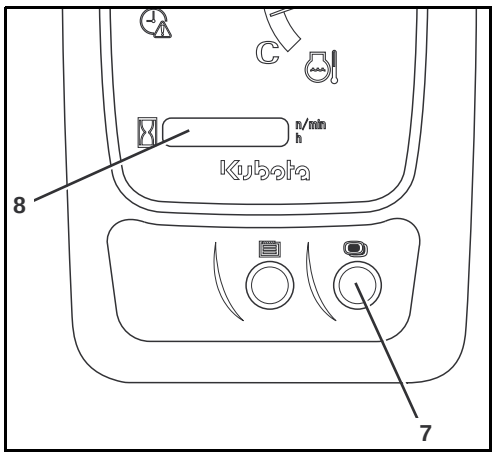


- Raise the control lever lock.
- Turn the starter switch to the START position and hold it there until the engine has started. Release the starter switch.
- Lower the left control console and make sure that the control lever lock engages.
- Let the engine run at middle speed until the operating temperature has been reached.

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

- Pull throttle lever in the direction of until the required revolutions per minute have been reached.

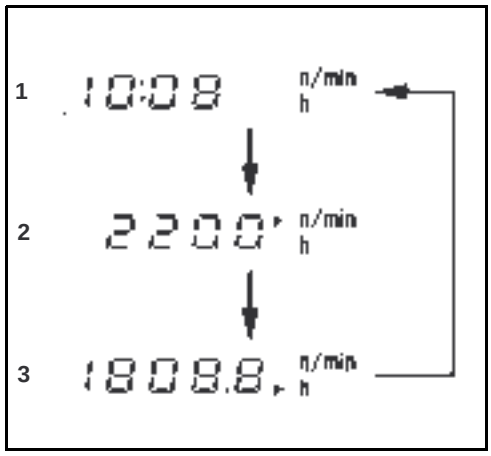
The display selector switch (7) allows you to switch between the indication of time, engine speed or hours of operation on the display (8).



The time (1) indicates the current time of day in hours and minutes.

The speed indicator display indication (2) indicates the current engine speed.

The hour of operation indicator (3) indicates the hours of operation of the excavator performed up to now, regardless of the engine speed.



Check the displays and indicators during operation (page 79).

Stopping the engine

If the engine is to be stopped to take the excavator out of operation, the services for taking the excavator out of operation (page 107) must be carried out.

- Push throttle lever in the following direction .
- Raise the left control console.
- Turn the starter switch to the STOP position and remove the key.

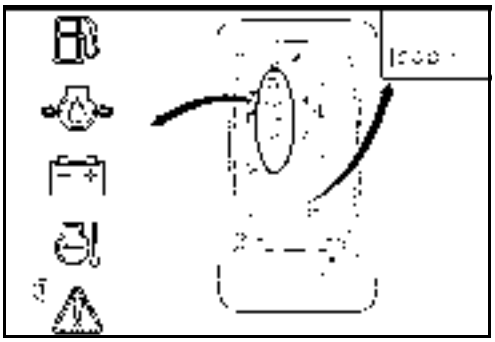
If the engine cannot be turned off, please enable the engine stop knob (page 26).

Observation of the displays after starting and during operation

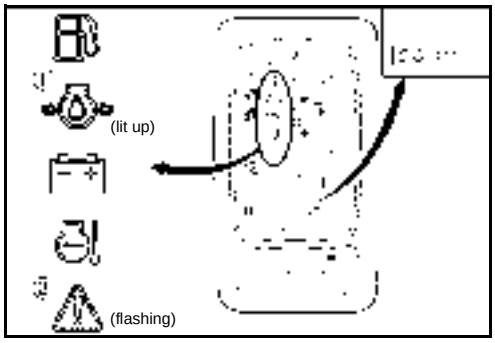
The operator must observe the display indicators and displays after starting and during operation.

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. Additionally, the display may show an error as in the figure on the right.

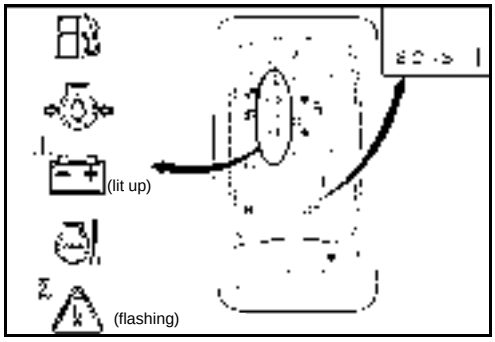
Clear the messages by taking appropriate steps, see Troubleshooting: Display indications (page 130), or contact skilled personnel if necessary.



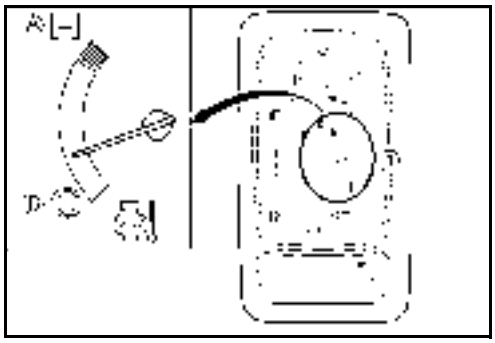
If the engine oil pressure becomes too low during operation, the engine must be stopped immediately. The engine oil pressure indicator (1) lights up, the warning light (2) flashes red and the display message appears as in the figure on the right.



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



The needle of the coolant temperature gauge (1) should be in the area between "C" (cold) and "H" (warm). If the needle rises up to range "H" (Red), cool down the engine by changing into idle.



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

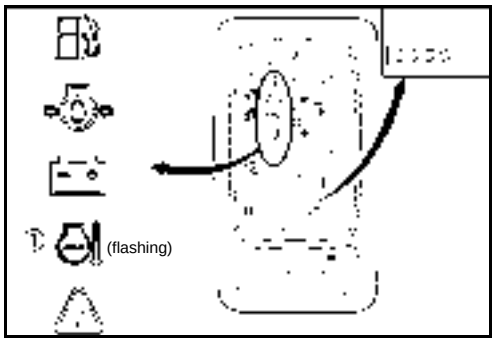
- Check the level of the coolant in the expansion tank.

STOP

Do not open the radiator cap → Risk of scalding.

- 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 side panel, the radiator, and the oil cooler are very dirty. If necessary: Clean the radiator (page 68).

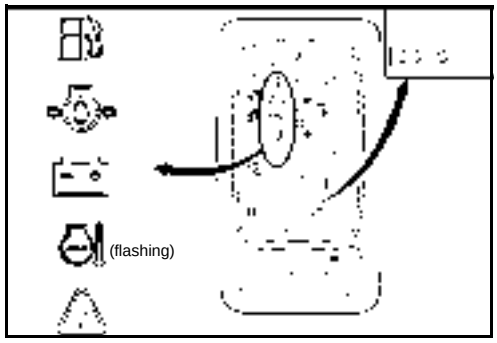
When the machine is being operated at or close to full capacity, the temperature of the coolant can rise a little higher than normal. The coolant temperature indicator (1) flashes and the message appears on the display as shown in the figure on the right.



The message fades out after a short time and the coolant temperature indicator flashes as long as the temperature remains elevated.

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 appears as in the figure on the right.



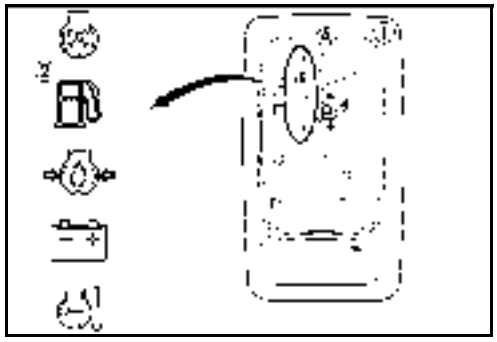
Allow the machine to idle for five minutes before switching off the engine!

- 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 117).
- 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 side panel, the radiator, and the oil cooler are very dirty. If necessary: Clean the radiator (page 68).
- Watch the fuel gauge (1).



The needle indicates the relative amount of fuel in the tank. As fuel is used up during operation, the needle slowly descends.

When the fuel tank is full, the needle points to the top (A).

When the fuel tank is empty, the needle points to the bottom (B).

When the fuel reserve indicator (2) is lit, there is only a little fuel is left in the tank, refuel excavator (page 118).

When operating the excavator on a slope, the fuel is displaced to one side of the fuel tank. In this situation, when the fuel level is low, the fuel pump may not deliver enough fuel, causing the engine to stall. The machine must be refuelled and the fuel system bled.

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

Also stop the engine immediately if

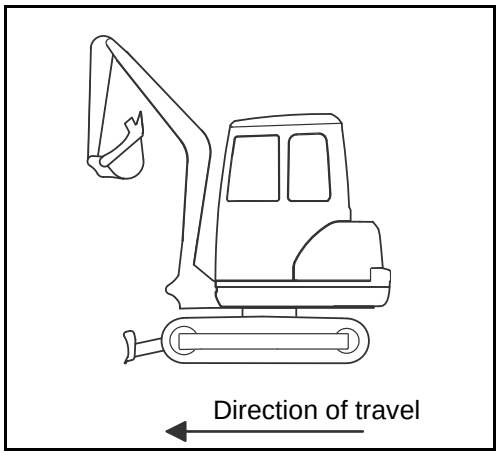
- The engine speed rises or drops suddenly
- Abnormal noises are heard
- The excavating devices do not respond to the control lever as expected
- The exhaust fumes are black or white When the engine is still cold, white smoke for a short time is normal.

Driving with the excavator

Models KX027-4 HI and KX030-4 HI are equipped with an automatic switching mechanism controlled by the torque, which automatically shifts the drive engines from travel speed into the more comfortable low speed, when driving at slower speeds with a heavy load or when turning, for example. However, for safety reasons, shifting back up into travel speed must always be done manually using the travel speed button.

- Adhere to the general safety rules (page 13) and the safety rules for operation (page 61).
- Carry out the pre-operational services (page 66).
- Start the engine (page 77).
- Observe the displays and indicators (page 79).

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



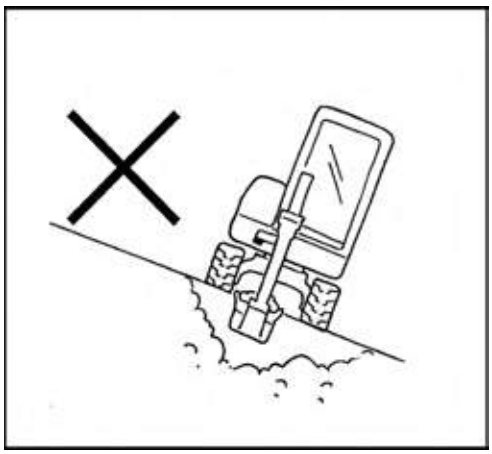
STOP

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

When working on slopes, observe the tilt of the excavator (see figure).

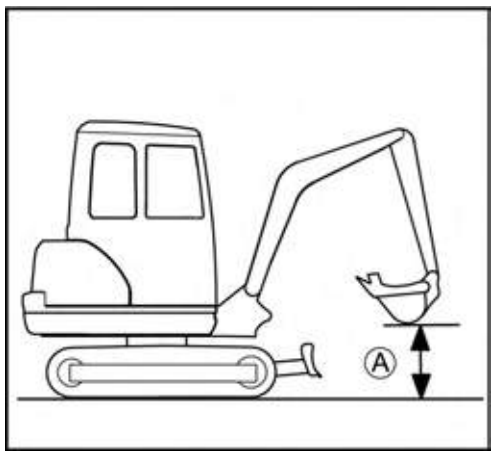
Climbing performance → 36 % or 20°

Max. lateral sway → 27 % or 15°



- Keep the bucket as low as possible when driving.
- Check the ground for stability, and verify whether there are holes or other potential obstacles.

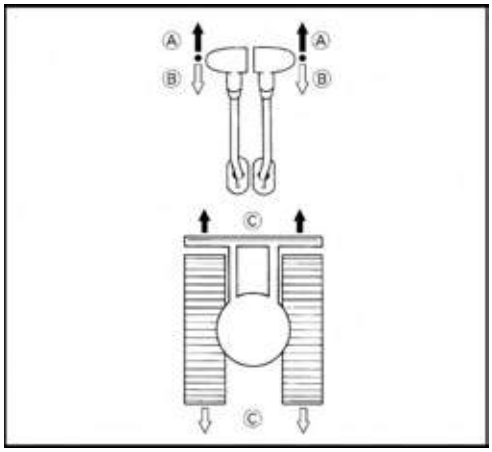
- Approach overhangs and edges of ditches carefully as they could cave in.
- Drive slowly downhill, do not allow the vehicle speed to increase uncontrollably.
- Close the cab door (cab version).
- When driving, the bucket should be approx. 200 to 400 mm (A) above the ground (see figure).
- Raise the dozer to the top position.
- Select an appropriate engine speed.



Driving

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

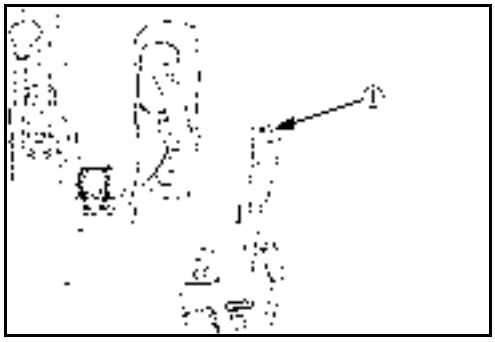
(A) Forward
(B) Reverse
(C) Straight ahead



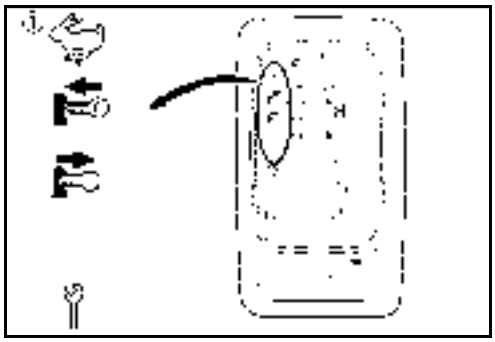
STOP

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 forward → The excavator reverses.

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



A tone sounds and the indicator (1) lights up. Renewed operating of the push button travel speed switches back to normal speed. Besides, audible signal sounds and the indicator goes out.



STOP

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

Turning

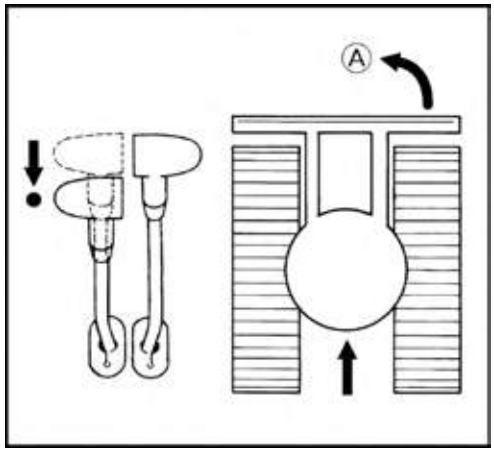
Turns are described for the forward direction of travel with the dozer at the front. If the dozer is positioned at the rear, the steering movements should be in the opposite direction.

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

During driving

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

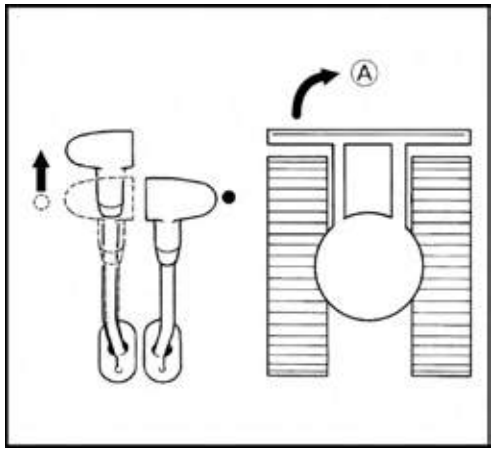
(A) The excavator makes a left turn.



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 excavator makes a right turn.

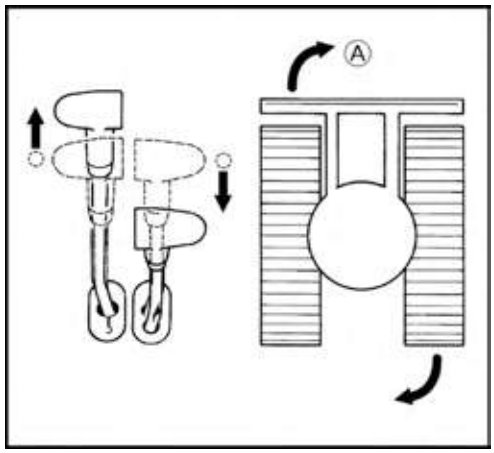


Turning on the spot

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.

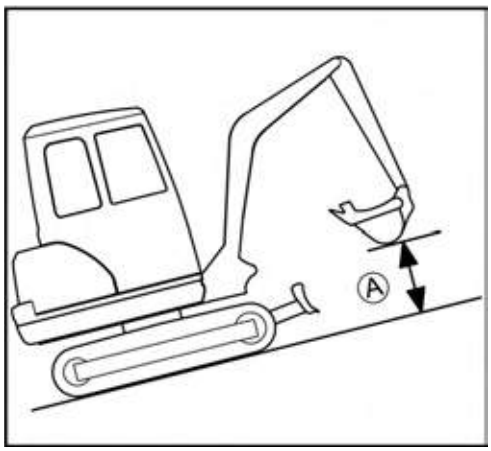
(A) Turning on the spot to the right.



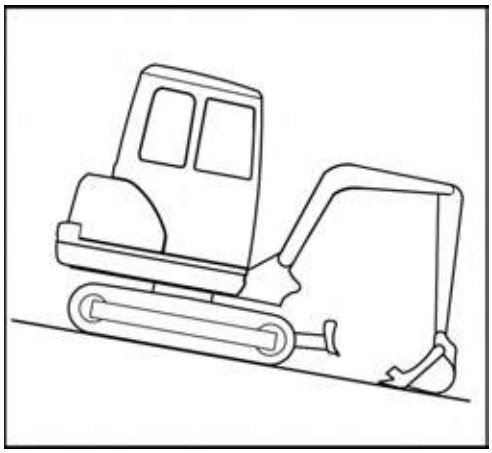
Driving uphill and downhill

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).

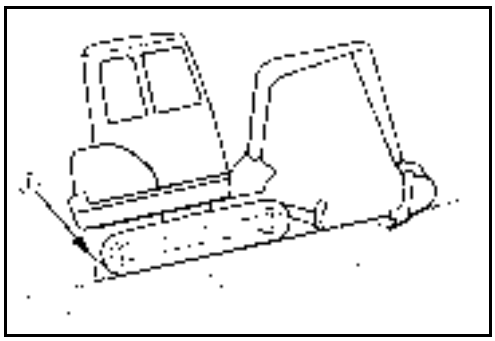


- When driving on gradients, let the bucket slide over the ground if the terrain allows it.



Stopping on gradients

Danger due to moving excavator!
If the excavator is stopped on a slope, park it so that it cannot move. Otherwise, there is a risk of being run over due to the moving excavator.

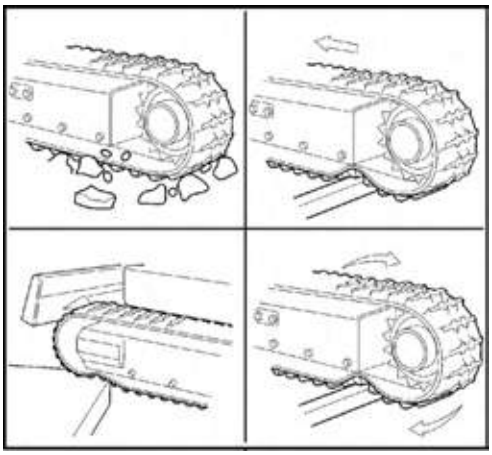


To securely park the excavator on gradients:

- Lower the dozer onto the ground.
- Dig the bucket as far as possible into the ground, or lower it onto the ground.
- Put the controls into neutral position.
- Secure the excavator from moving using wedges (1).

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.



- The crawler can become blocked due to too much dirt and sand. In this case, reverse the machine a short distance in order to loosen dirt and sand.
- 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.)

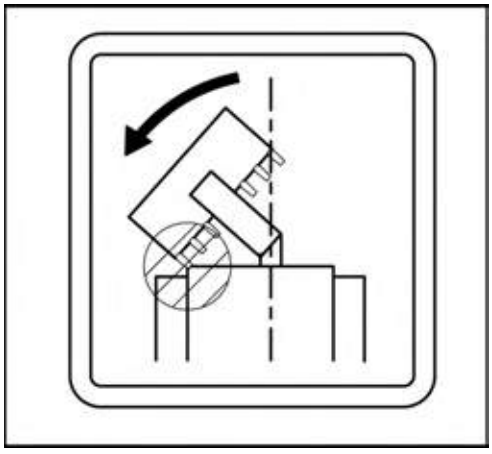
Operating the controls during excavation work

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

- 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 (accessory).
- 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 in reverse, make sure that the boom 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 bulldozer blade onto the ground. The dozer may only be used if the dozer cylinder is equipped with a pipe safety valve.

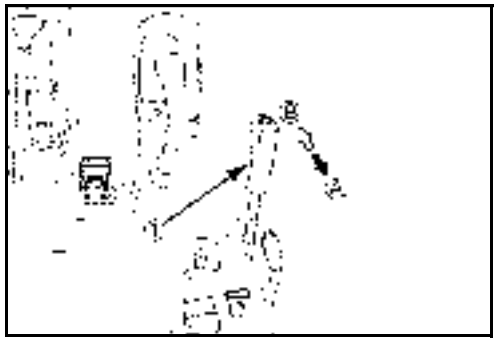
Note on using wider and deeper buckets

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

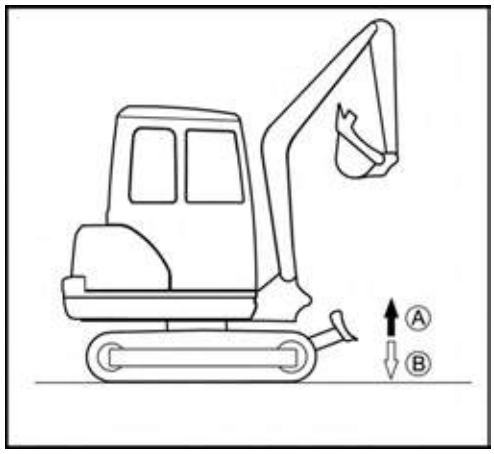
When working with the dozer, operate both drive levers with the left hand and the dozer control lever with the right hand.



- To lift the dozer, pull the dozer control lever (1) back.
- To lower the dozer, push the dozer control lever forward.

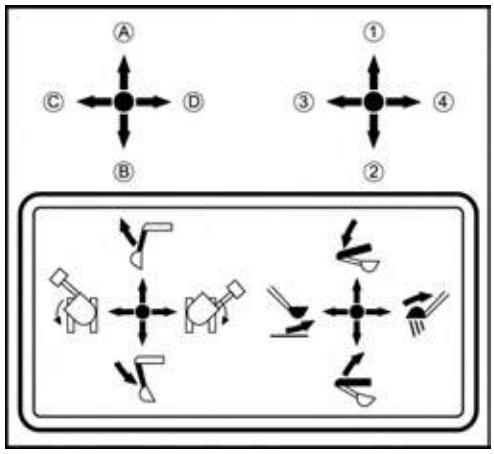
(A) Dozer up.

(B) Dozer down.



Overview of control lever functions

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

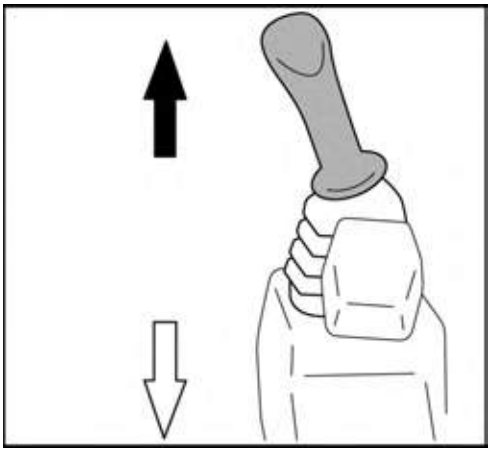


Control lever		Movement
Right control lever	1	Lower boom
	2	Raise boom
	3	Bucket crowd
	4	Bucket dump
Left control lever	A	Arm dump
	B	Arm crowd
	C	Swivel frame to the left
	D	Swivel frame to the right

Operating the boom

If the excavator 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/⇩).

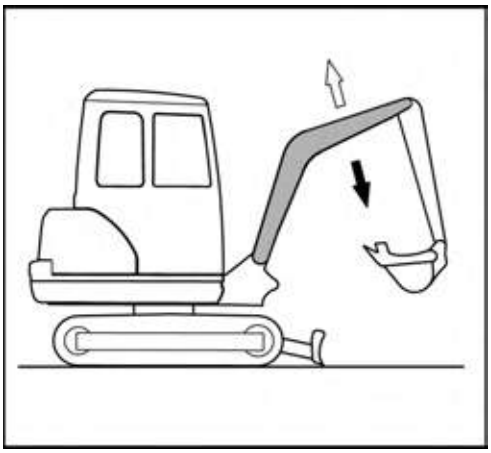


The hydraulic cylinder of the boom is equipped with a cushioning function, which prevents the excavated material in the bucket from falling out. When the hydraulic system operating temperature is low, the cushioning is delayed by approx. 3 to 5 s. This delay is due to the viscosity of the hydraulic oil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

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

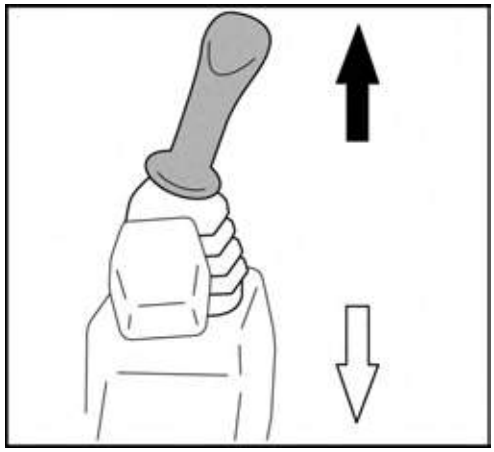
Watch the boom during lowering, so that the boom or the bucket teeth do not hit the dozer.

The boom moves as shown in the figure.

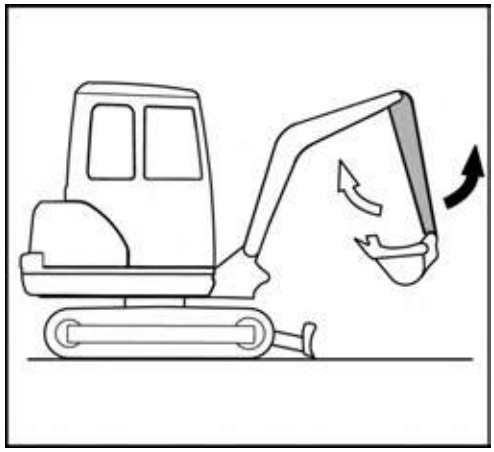


Operating the arm

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

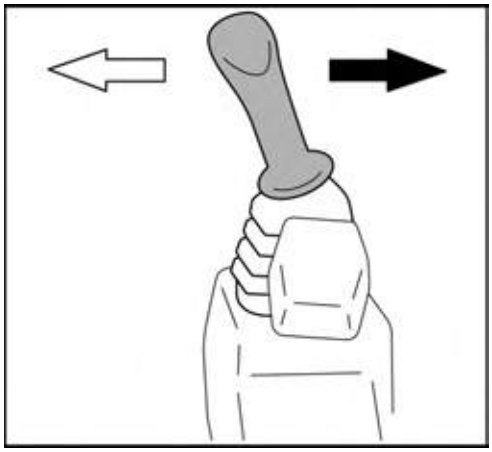


The arm moves as shown in the figure.



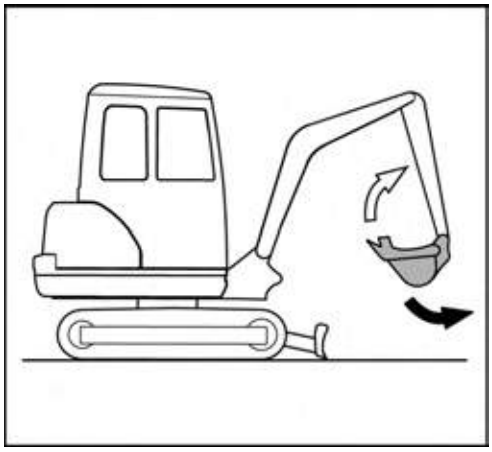
Operating the bucket

- 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.

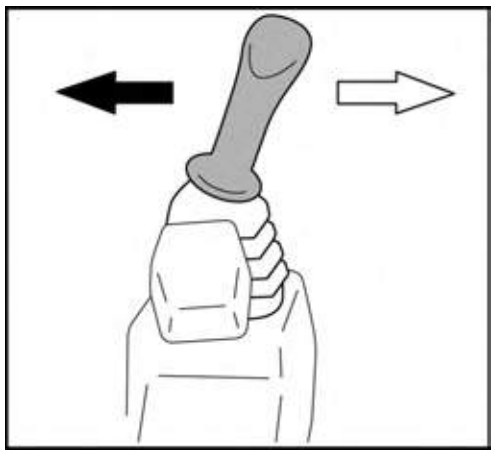


Swivelling the swivel frame

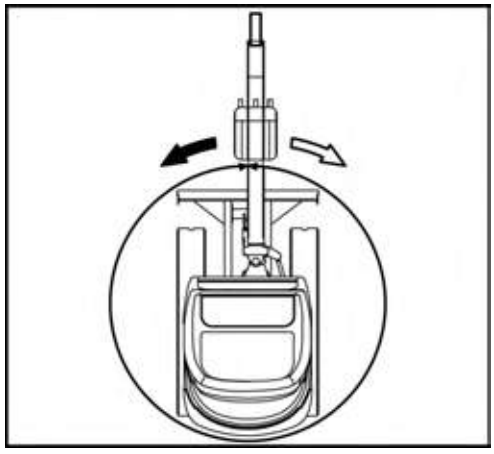
No person is allowed to stand in the swivel area during the movement.

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.

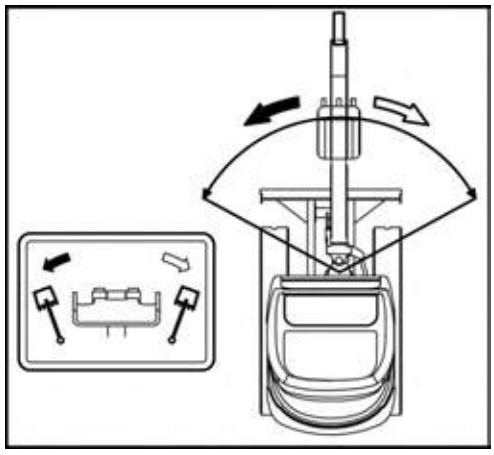


Swinging the boom

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 to the left, press down on the left-hand side of the boom swing pedal (figure/🡐).
- To swing the boom to the right, press down on the right-hand side of the boom swing pedal (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 port

The auxiliary port serves for operating attachments.

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.

The performance data for the auxiliary port can be found in the "Technical data" section (page 39).

Make sure that, before carrying out the activities in the auxiliary port connectors, the hydraulic system (page 104) has been depressurised. Depending on the operation setting, the return change valve has to be set to the appropriate position (page 103).

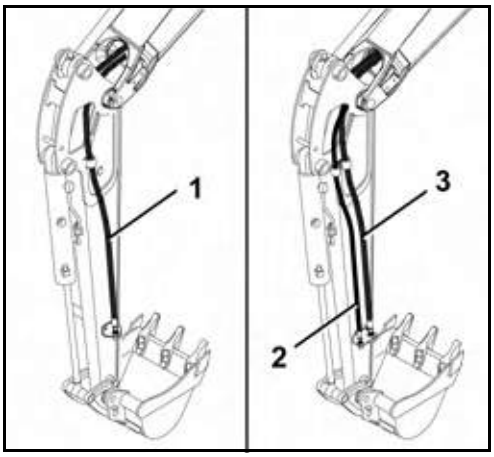
The auxiliary ports may only be activated when an implement is attached.

If the auxiliary port has not been used for a long period of time, dirt particles could have accumulated on the connectors of the conduits. 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.

Models KX027-4 and KX030-4 are equipped with a hydraulic auxiliary port. An auxiliary port connector (1) is located on both the left and right side of the arm. The auxiliary port function is controlled with the auxiliary port pedal.

Models KX027-4 HI and KX030-4 HI are equipped with two hydraulic auxiliary ports. One connector each for auxiliary port 1 (2) and auxiliary port 2 (3) is located on the right and left side of the arm. The auxiliary port functions are each controlled with the rocker switch for auxiliary port 1 and the rocker switch for auxiliary port 2.

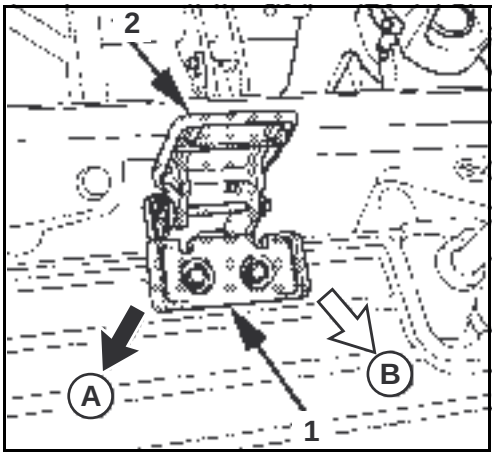


- Start the engine (page 77) and idle it until the operating temperature has been reached.

The auxiliary ports can only be switched off by turning the key switch to the STOP position or by lifting the control lever lock!

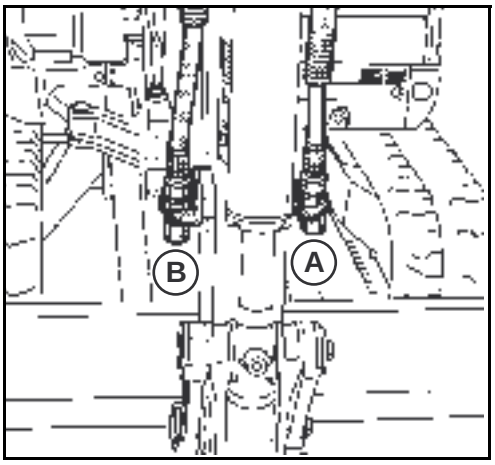
Operating the auxiliary port (KX027-4, KX030-4)

The auxiliary port pedal (1) can be protected against unintentional operating by turning the locking flap (2). If the auxiliary port pedal is not used, the locking flap must be folded in.



- When operating the right pedal part (figure/⇩) there is an oil flow at the connector B (figure below).
- When operating the left pedal part (figure/🡻) there is an oil flow at the connector A (figure below).

(A) Connector for left pedal part
(B) Connector for right pedal part

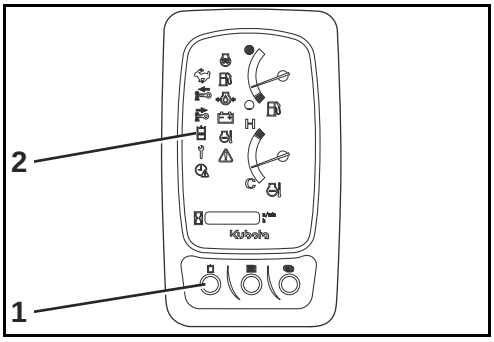


Activating the auxiliary port function (KX027-4 HI, KX030-4 HI)

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 99) for details.

The auxiliary ports are switched on using the auxiliary port switch (1). This switch is active when the left control console is lowered and the starter switch is in the RUN position. When auxiliary port 1 is switched on, auxiliary port indicator 1 (2) lights up or flashes.

Using this switch, you can also set the operation settings.



Operating auxiliary port 1 (KX027-4 HI, KX030-4 HI)

The proportional control enables you to smoothly control the implement speed. Example: If you press the rocker switch halfway to the left, the implement moves at approximately half speed.

The connectors for auxiliary port 1 and the rocker switch for auxiliary port 1 (3) are illustrated in the figure.

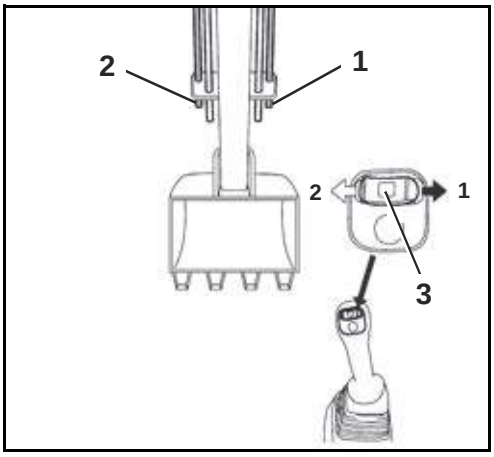
- Switch on the auxiliary port on the display and control unit.
- Press rocker switch for auxiliary port 1 in the direction ➔.

The oil flows to the right connector (1) of the arm.

- Press rocker switch for auxiliary port 1 in the direction ⇦.

The oil flows to the left connector (2) of the arm.

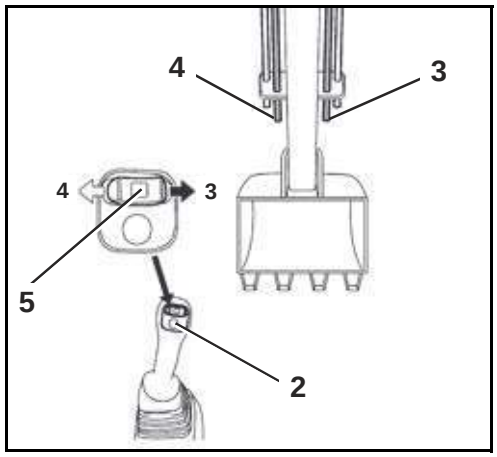
- To deactivate auxiliary port 1, turn the key switch to the STOP position or lift the control lever lock.



Operating auxiliary port 2 (KX027-4 HI, KX030-4 HI)

The proportional control enables you to smoothly control the implement speed. Example: If you press the rocker switch halfway to the left, the implement moves at approximately half speed.

The connectors for auxiliary port 2 and the rocker switch for auxiliary port 2 (5) are illustrated in the figure.



- Switch on the auxiliary port on the display and control unit.
- Press rocker switch for auxiliary port 2 in the direction ➔.

The oil flows to the right connector (3) of the arm.

- Press rocker switch for auxiliary port 2 in the direction ⇦.

The oil flows to the left connector (4) of the arm.

- To deactivate auxiliary port 2, turn the key switch to the STOP position or lift the control lever lock.

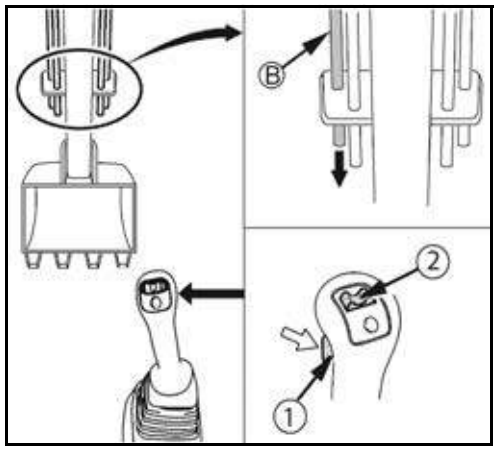
One way hold operation (KX027-4 HI, KX030-4 HI)

For one way hold operation, the return change valve has to be set to the direct return flow position (page 103).

Switching on

- Briefly push the one-way hold switch (1).

The oil flows on one side to auxiliary port 1 (B) on the left-hand side of the arm.



Switching off

- Briefly push the one-way hold switch again or briefly push the rocker switch for auxiliary port 1 (2) to the right or left.

The oil flow is shut off.

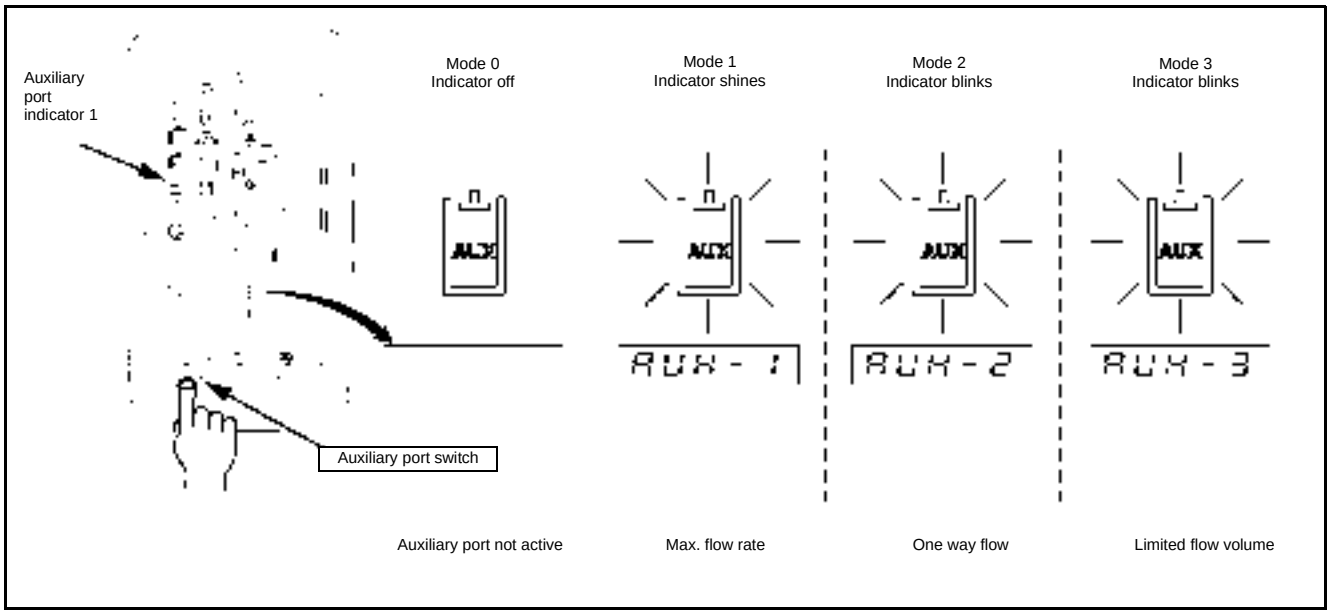
Operating modes (KX027-4 HI, KX030-4 HI)

Auxiliary port 1 is preset at the factory to allow four operating modes to be selected. Up to six operating modes can be preset.

Whenever the auxiliary port button is pressed the operating mode changes by one level.

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

Select the mode of operation



If auxiliary port 1 is enabled on the display and control unit and an operating mode has been selected, pressing the display selector switch (1) shows the configured flow rate on the right auxiliary port connector and then on the left auxiliary port connector for few seconds on the display (2).