

Operating the controls during excavation work



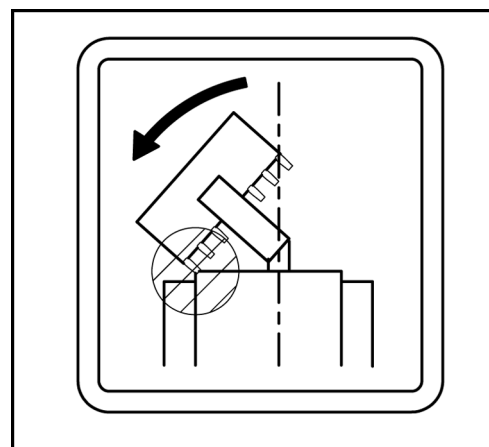
Always observe the following safety instructions when working with the machine.

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

Note on using wider and deeper buckets



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

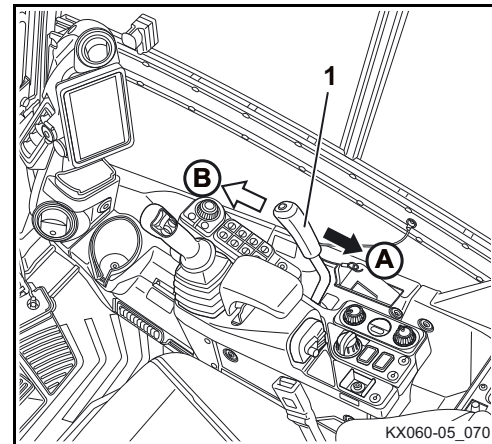


Operating the dozer



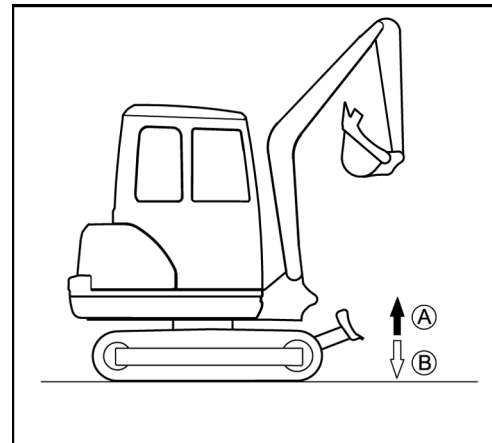
When working with the dozer, operate both drive levers with the left hand and the dozer control lever with the right hand.

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



(A) Dozer up.

(B) Dozer down.



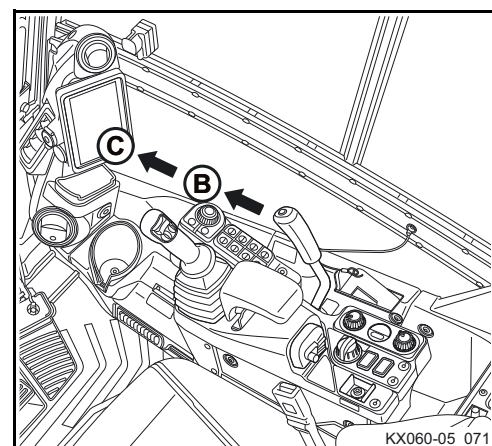
Floating position



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

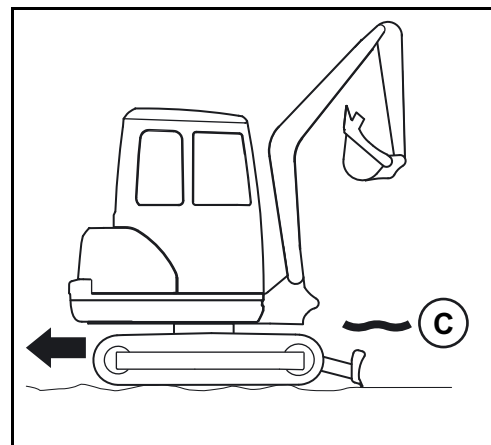
The dozer control lever is used to switch on the floating position. Enabling the floating position releases pressure from the dozer cylinder. This function is used to level the surface while driving in reverse, for example, in order to follow the contour of the surface with the dozer.

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



Operation

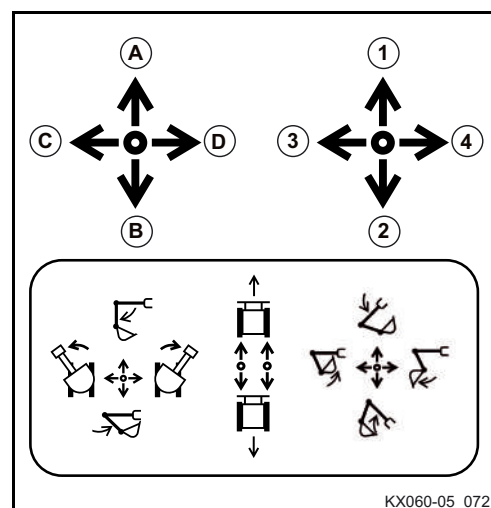
The dozer remains in the floating position until the dozer control lever is returned to the neutral position



Overview of control lever functions (standard setting)

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

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



Operating the boom

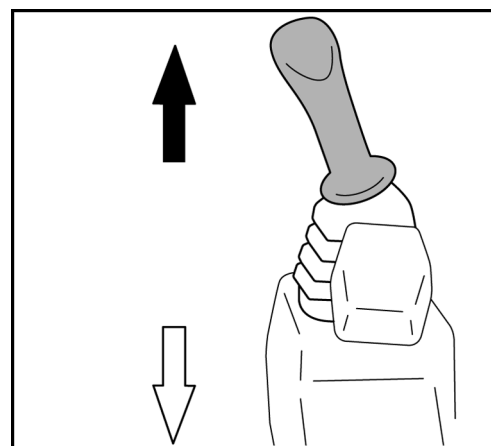
If the machine is overloaded, the boom must be lowered until the load rests on the ground. To prevent personal injuries and damage to equipment, do not operate any other functions (e.g. moving the swivel frame).

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



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

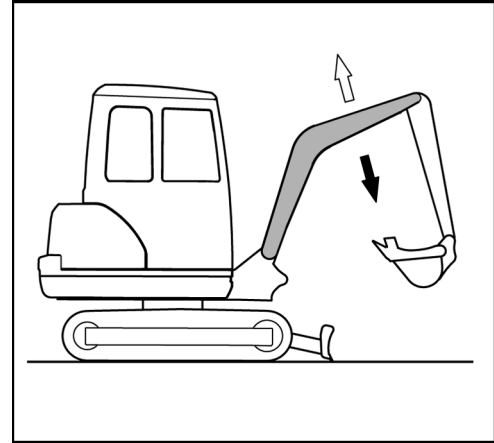
- To lower the boom, push the right control lever forward (figure/↗).





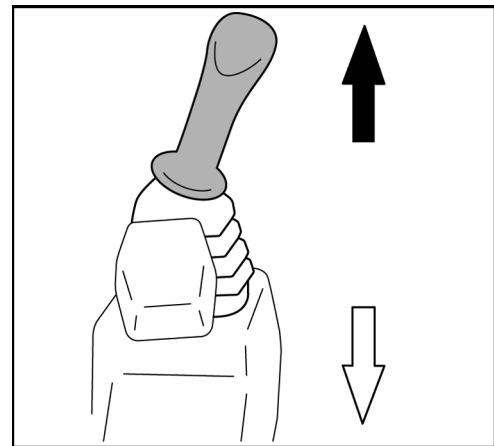
Watch the boom during lowering, so that the boom or the bucket teeth do not hit the dozer.

The boom moves as shown in the figure.

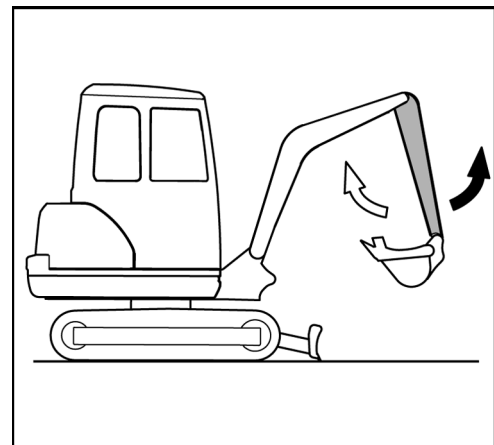


Operating the arm

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



The arm moves as shown in the figure.

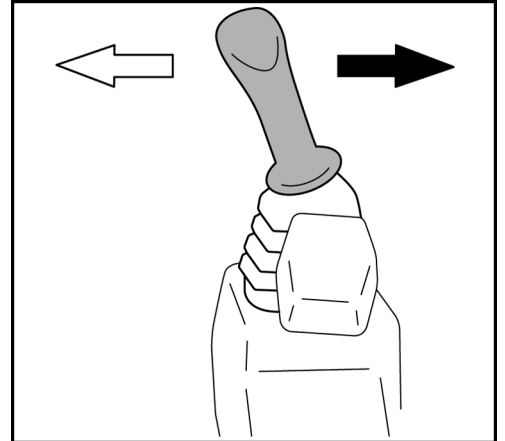


Operating the bucket

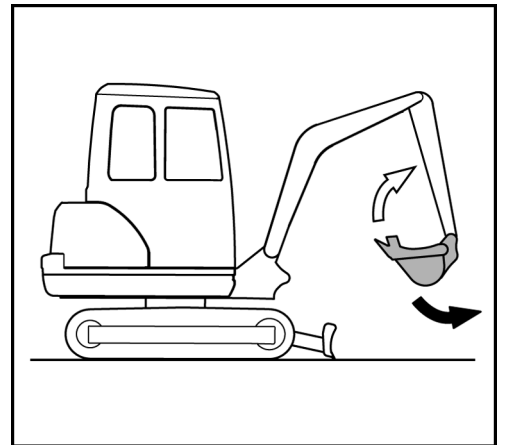
- To crowd (digging) the bucket, move the right control lever to the left (figure/←).
- To dump (empty) the bucket, move the right control lever to the right (figure/→).



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



The bucket moves as shown in the figure.



Swivelling the swivel frame

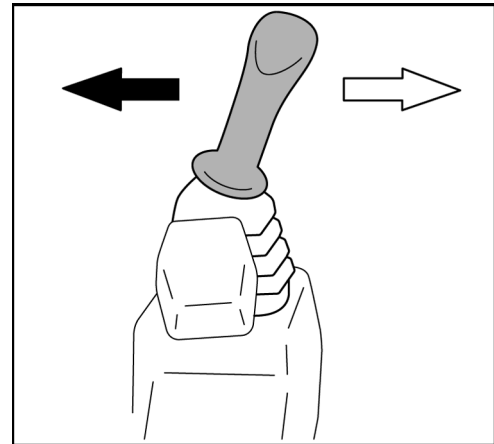


No person is allowed to stand in the swivel area during the movement.

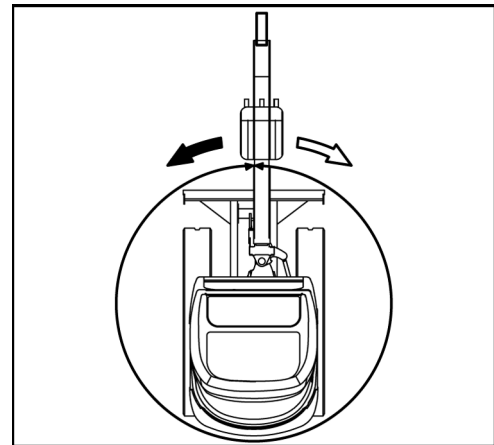


Swivel carefully to avoid any contact of the front attachments with adjacent objects.

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



The turning operation takes place as shown in the figure.



Swinging the boom



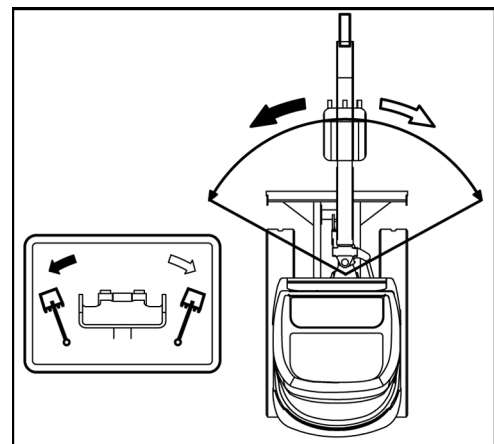
No person is allowed to stand in the swing area during the movement.



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

- To swing the boom counter-clockwise, press the boom swing pedal on the left-hand side (figure/←).
- To swing the boom clockwise, press the boom swing pedal on the right-hand side (figure/⇒).

The figure details the swing movement.



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

Operating the auxiliary ports

The auxiliary port is used for hydraulic implements, such as a breaker. You can set the flow rate prior to operating the auxiliary port. (Described in the "Flow rate setting" section (page 127))

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



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



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



For power rating of the auxiliary ports, see the "Technical data" section (page 46).



Make sure that, before carrying out the activities in the auxiliary port connectors, the pressure relief of the hydraulic equipment (page 131) and the auxiliary port connectors (page 131) has been carried out. Depending on the operation setting, the return change valve has to be set to the appropriate position (page 130).



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



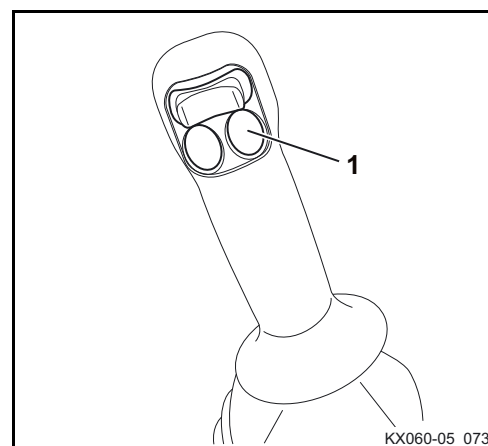
If the auxiliary ports have not been in use over a long period of time, dirt may have accumulated on the pipe connections. Before installing the attachment, drain approx. 0.1 l of hydraulic oil at each port.



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

Activating the auxiliary port function

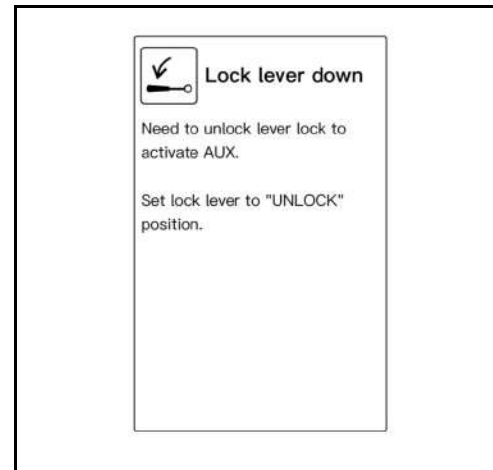
- Turn the starter switch to the RUN position.
- Start the engine (page 96) and idle it until the operating temperature has been reached.
- Lower the control lever lock.
- Press the auxiliary port enable switch (1).





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

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



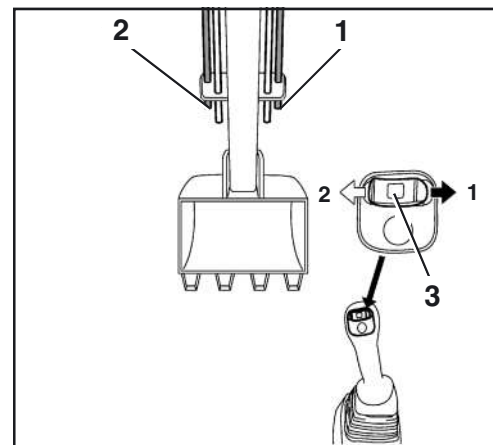
AUX port 1

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



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

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



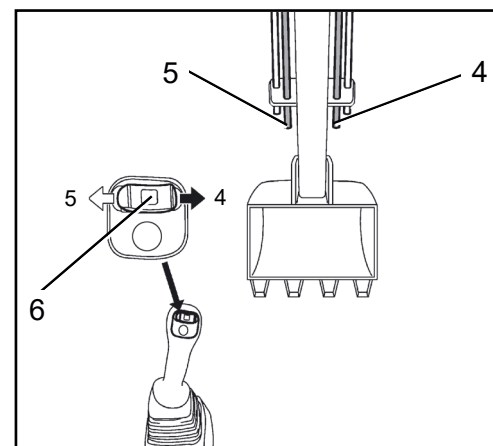
AUX port 2 (optional)

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



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

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

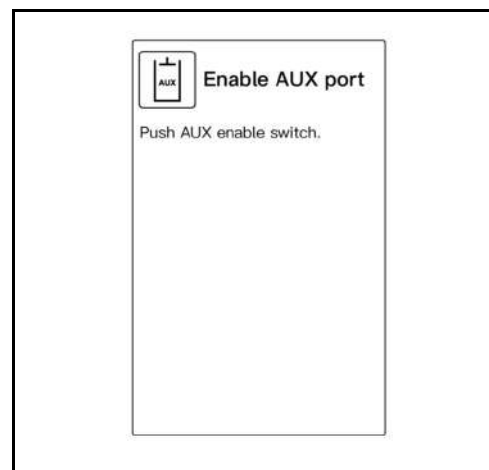




Only when the auxiliary port function is enabled, the rocker switch allows the oil to flow towards the auxiliary port. If this function is disabled, no oil flows towards the auxiliary port.

The message appears as in the figure on the right.

- Press the AUX enable switch first and then handle the rocker switch.



One-way hold operation



For one way hold operation, the return change valve has to be set to the direct return flow position (page 130).



The attachment can move in an uncontrolled and sudden manner, there is a danger to life in the working area!

When using accessories that are not suitable for continuous oil flows (e.g. Powertilt), using the one-way hold switch poses a danger to life!

The auxiliary port cannot be operated proportionally with the one-way hold switch. The flow volume is adjusted to the highest level in the factory.

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

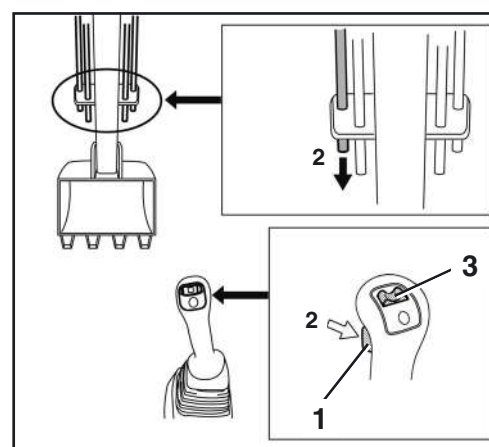
- Activate the operation setting for the "one way flow".

Switching on

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

Switching off

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



Operating modes

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

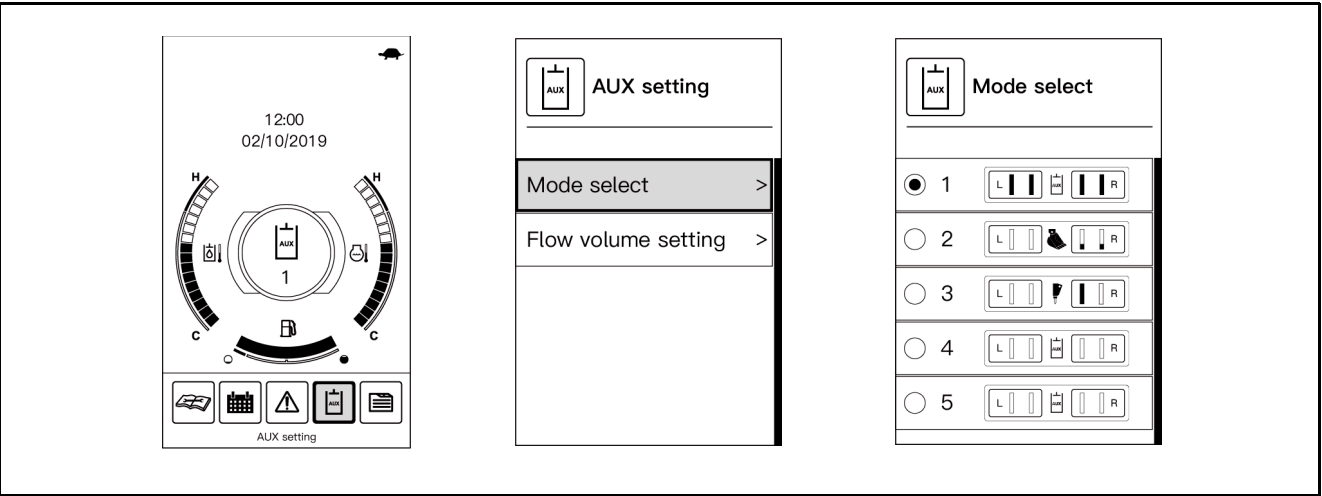
The operating mode can be changed on the “Mode select” screen (page 126).

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



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

Select the mode of operation



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

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

The menu bar appears in the display.

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

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

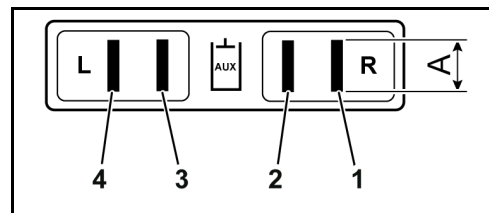
- Press Jog dial (enter switch).

The "Mode select" menu appears in the display.

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

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

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



Flow rate setting

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



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



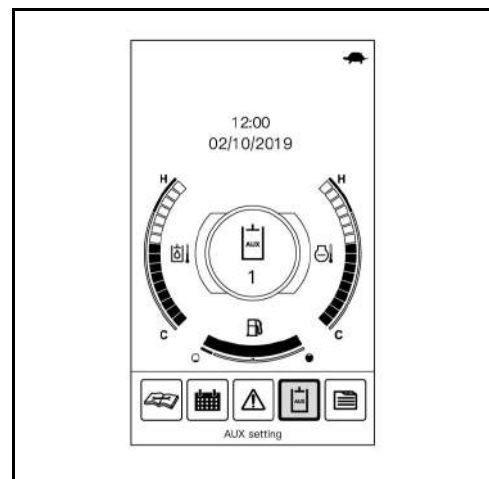
It is recommended to adjust this setting during the operation of the implement.

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

The menu bar appears in the display.

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

The AUX setting appears in the display.

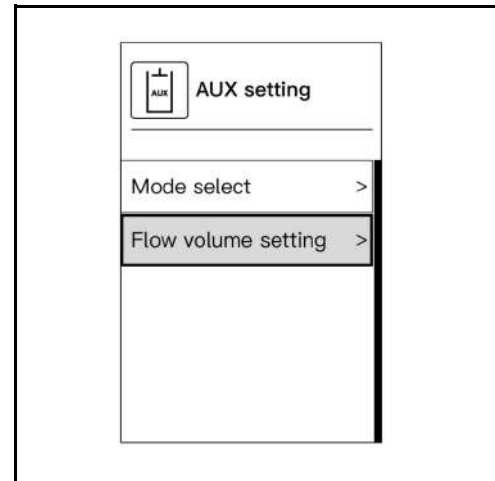


- Rotate jog dial to the right until “Flow volume setting” is selected in the display.
- Press Jog dial (enter switch).

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

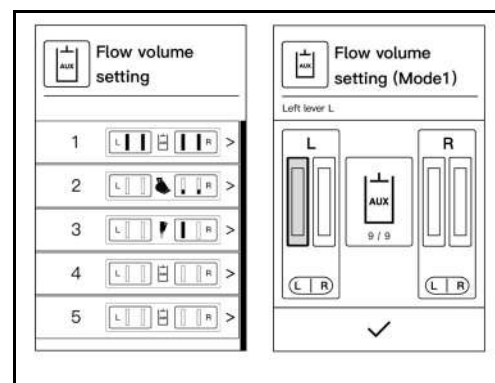
- Rotate jog dial to the right or the left until the desired mode is selected.
- Press Jog dial (enter switch).

The “Flow volume setting” appears in the display.



Settings with symbol:

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

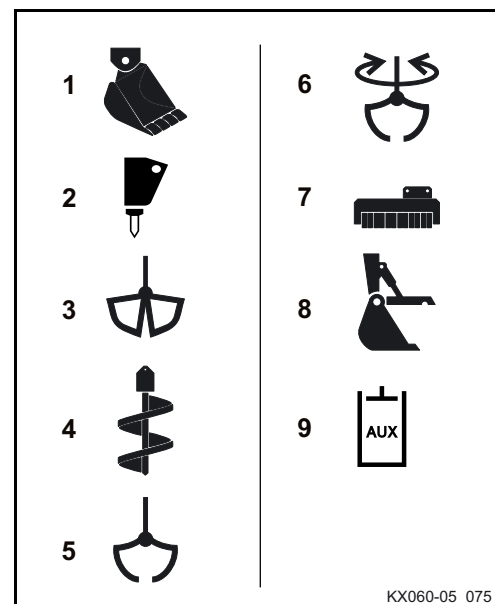


You can select the following symbols:

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



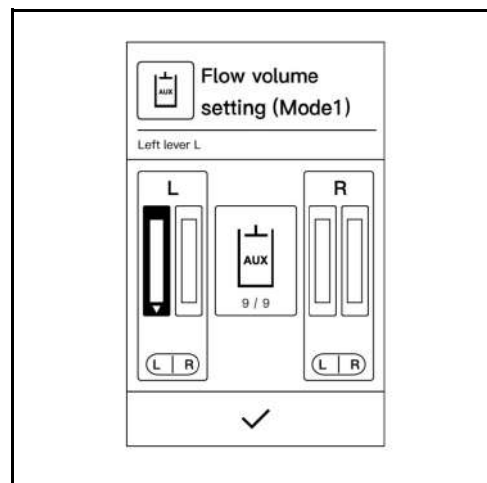
There is no relationship between the icons and the flow control settings. Select icons to suit the images of attachments to be connected.



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

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



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

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

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

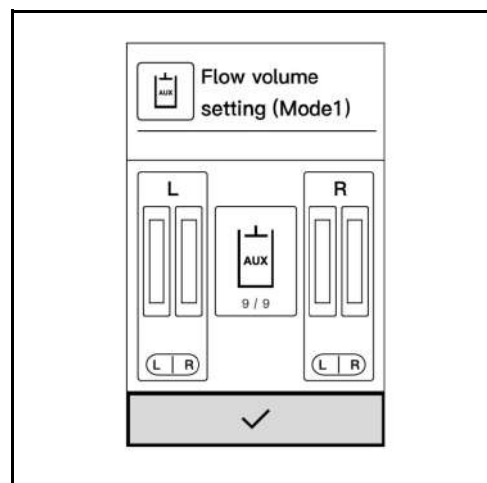
- Rotate jog dial to the right until ✓ (icon of acknowledge) is selected in the display.
- Press jog dial (enter switch) to complete "Flow volume setting".



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

- To cancel your input, press return switch.

The display returns to its previous display mode.



Return change valve for direct return flow

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

The change valve has two settings:



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



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

Activating the return change valve

When "direct return flow" (3) is enabled, the return flow is directed from the attachment to the hydraulic oil tank via the return filter. The return flow is directed via the right auxiliary port 1 connector at the arm only.

- Flip the lever on the change valve (1) to the horizontal position (3).

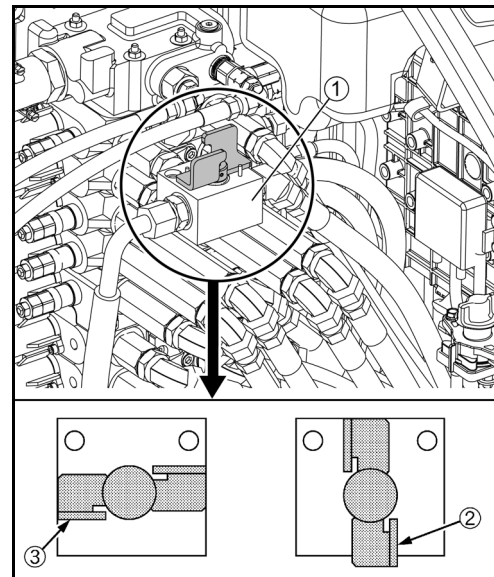
The direct return flow is enabled.

When "indirect return flow" (2) is enabled, the return flow is directed from the attachment to the return filter via the control valve and then to the hydraulic oil tank. In that case, the return flow may use the left or right auxiliary port 1 connector of the arm (depending on the position of the rocker switch for auxiliary port 1).

- Flip the lever on the change valve (1) to the vertical position (2).

The indirect return flow is enabled.

Move the return change valve to the required position as shown in the figure, depending on the action of the implement being used (rotary or breaking).



If the change valve is in position "direct return flow", although an attachment with indirect return flow has been mounted, the return flow to the hydraulic tank remains open! This can lead to sudden movements or falling down of the attachment, even if the machine has been switched off.

- *Make sure that the change valve is switched according to the attachment.*

Depressurising the hydraulic system



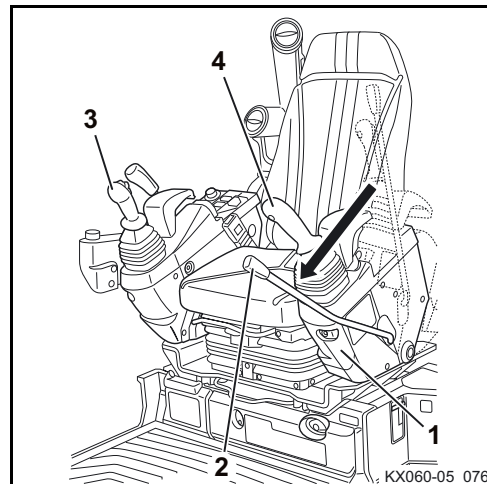
Perform the pressure relief procedure immediately after stopping the engine!

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



Do not start the engine!

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



The hydraulic system has been depressurised.

Depressurising the auxiliary ports



Perform the pressure relief procedure immediately after stopping the engine!



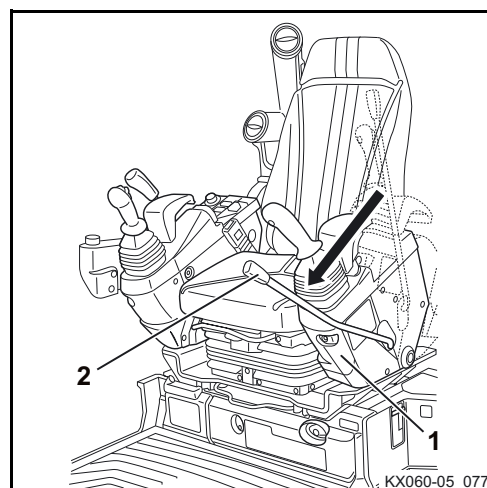
The machine comes with auxiliary port 1 only or with auxiliary port 2 additionally. The following description illustrates the pressure relief process for both auxiliary ports. According to machine equipment, the corresponding description is to be applied.

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

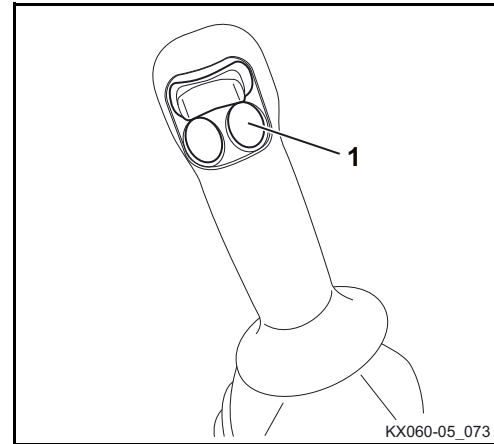


Do not start the engine!

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

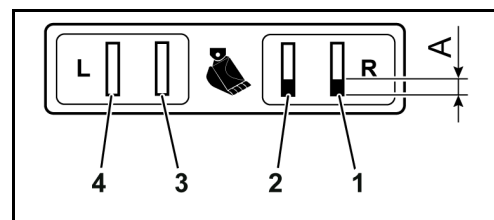


- Press the auxiliary port enable switch (1) and turn on the auxiliary port function.



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

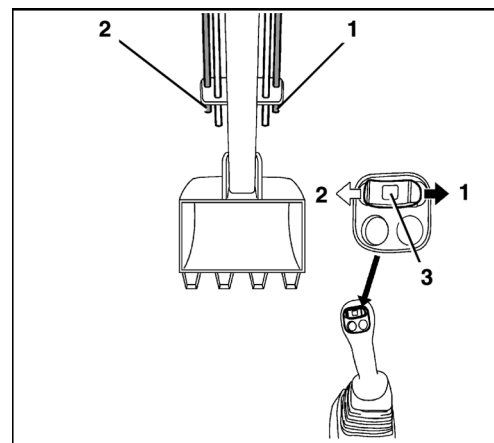
If the bar graph is set to the lowest level (as shown in connector 3, no bar obvious), flow is blocked and there is no oil flow.



If the flow is blocked, the pressure cannot be relieved completely. The hydraulic couplings at the auxiliary port connectors can jam as a result. Then connection or separation of the hydraulic cables of attachments is not possible. Switch to a different mode, if available (page 126), or increase the flow rate (page 127).

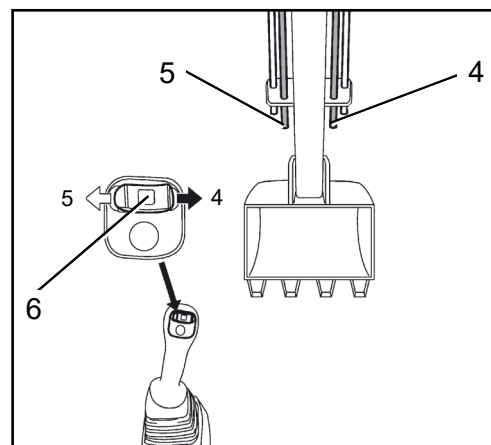
- Make sure that the flow rates are not set to the lowest level.
- Rocker switch auxiliary port 1 (3) on the right control lever must be pushed over completely to the right and left.

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



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

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



Placing out of operation



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

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

Boom:	Half-extended
Arm:	Half-extended
Bucket:	Half-extended
Dozer:	Lowered to the ground
Swing mechanism:	Front attachments lowered centrally to the ground
- Stop the engine (page 99).
- Remove the key.
- Unbuckle the seat belt and lift the left control console.
- Refuel the machine, if necessary (page 147).
- Close and lock all windows.
- Close and lock all covers.
- Close and lock the cab door. The key must remain with the operator.
- Check the machine for external damage and for leaks. Any failures must be repaired before the next start.
- In case of a heavy accumulation of dirt in the area of the tracks and the hinges at the front attachments, clean the machine (page 181).



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

Operating the heating and air-conditioner system (optional)



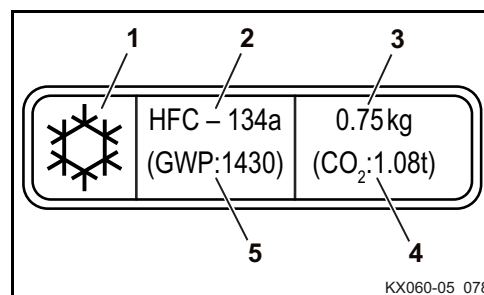
This air conditioner contains fluorinated greenhouse gases (F-gases).

Refrigerant	Amount (kg)	CO ₂ -equivalent (t)	Global Warming Potential (GWP*)
HFC-134a	0.75	1.08	1430

* GWP = Global Warming Potential

Explanation of the information label:

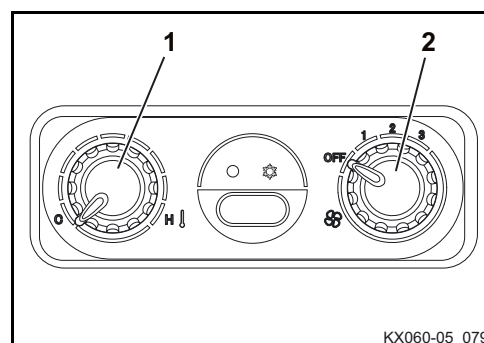
1. Marking that the air conditioner contains F-gas
2. Industrial name of the F-gas that it contains
3. F-gas amount (in kg) in the air conditioner
4. Equivalent mass (in t) of the F-gas carbon dioxide (CO₂)
5. F-gas global warming potential (GWP)



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

Heating the cab

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



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

Operation

- To heat the cab faster, switch the air intake to the “circulating air” position (A) with lever (1).

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

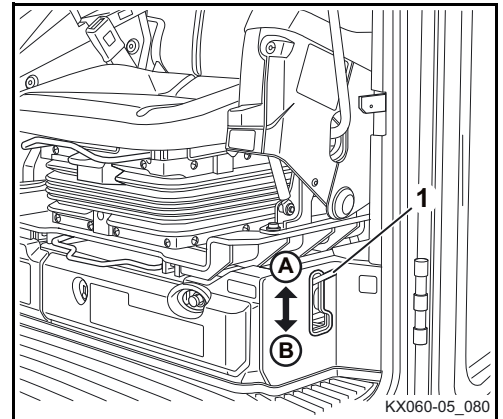
To prevent the windows from steaming up while operating the heater for extended periods of time, the air intake should be switched back to the “fresh air” position (B) after the cab has warmed up.



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



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

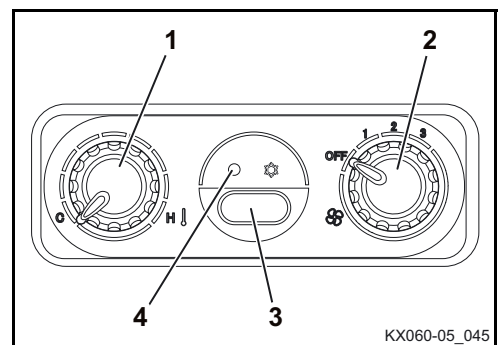


Cooling the cab

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



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

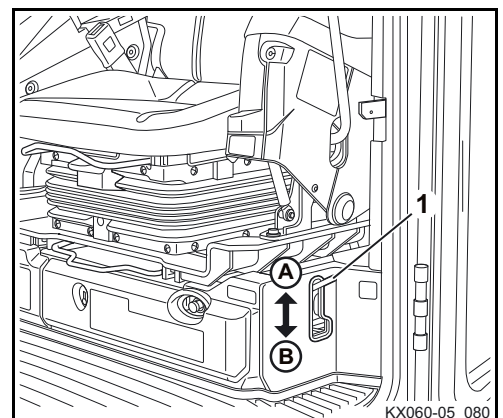


- To cool down the cab faster, switch the air intake to the “circulating air” position (A) with lever (1).

No warm outside air will enter and the circulating inside air cools down faster.



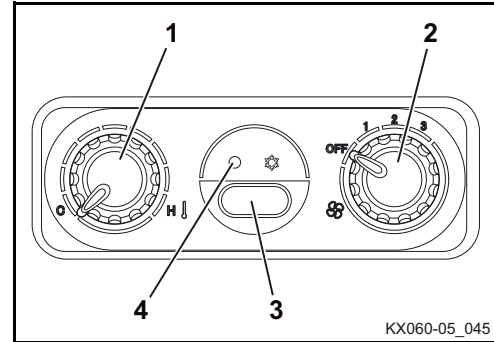
Lasting circulating air mode leads to overtiring of the operator! A lasting use of the circulating air mode may cause a lack of oxygen inside the cab. No cool fresh air flows in from the outside. The operator therefore overtires quickly..



De-icing or demisting the windows

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

- Set the temperature control (1) to the "Warm" position.
Blue → Cold
Red → Warm
- Set the blower switch (2) to the 3 position.
- Use the air-conditioner switch (3, optional) to switch the system on.



The indicator (4) lights up.



The air-conditioner will dehumidify the cab air.



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

- Direct the air nozzles towards the front window.

After de-icing the windows or cleaning them of condensation, the air conditioner may be turned off.

- Use the air-conditioner switch to switch the system off.

The indicator in the air-conditioner switch stops glowing.

Operating the wiper/washer system

All cab models are equipped with a wiper/washer system.



Risk of damage to components!

When you turn on the wiper while the windscreen is opened, the wiper can hit the adjacent cab components causing damage to the wiper.

- Do not turn on the wiper switch while the windscreen is open.

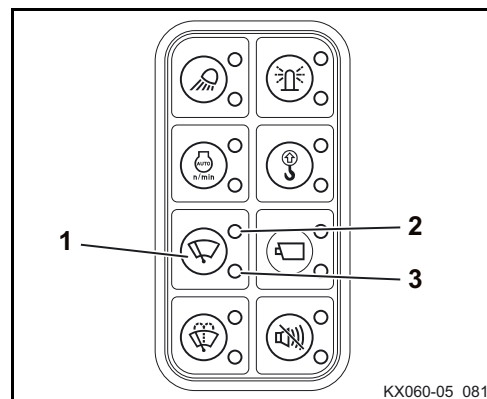
Switching on the windscreen wiper

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

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

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

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



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



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

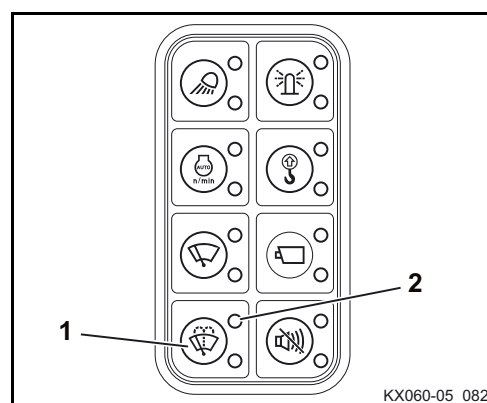
To turn on the washer system

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

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



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

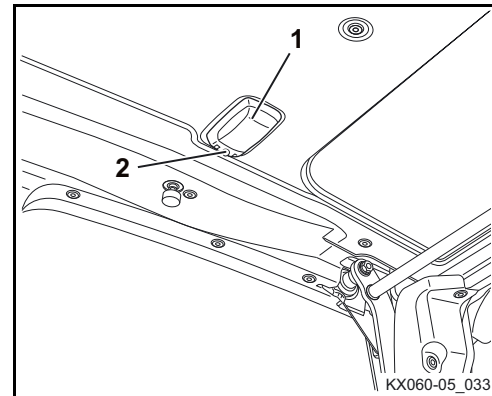


Operating the room light

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

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

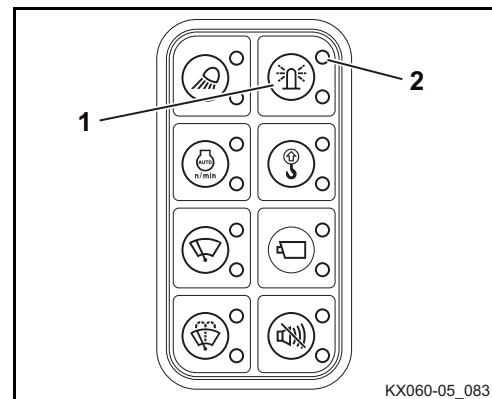
- To switch off, press the switch (2) to the OFF position.



Operating the rotary beacon (optional)

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

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

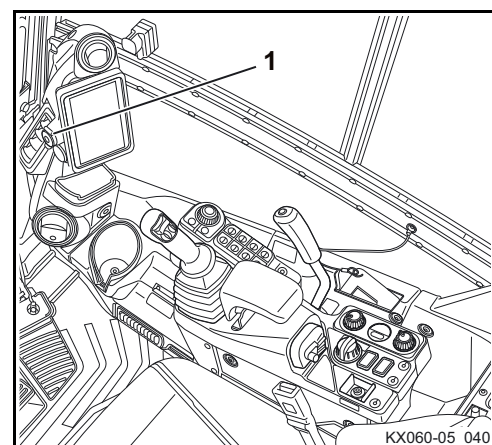


Operating the 12 V plug

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



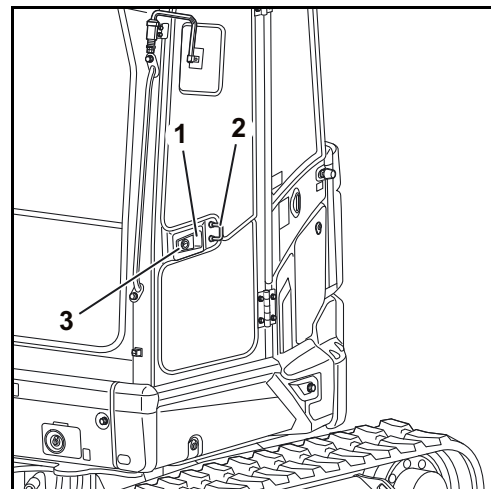
The rated current of the connected load must not exceed 10 A.



Opening and closing the cab door

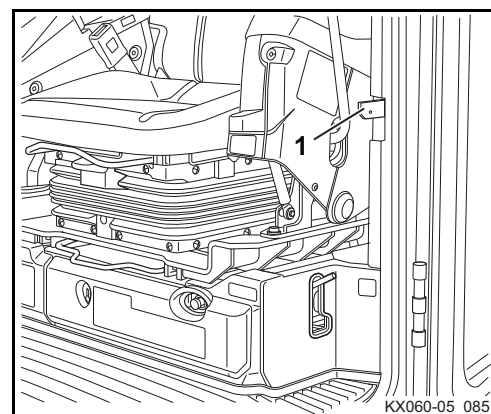
Opening the cab door from outside

- 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.



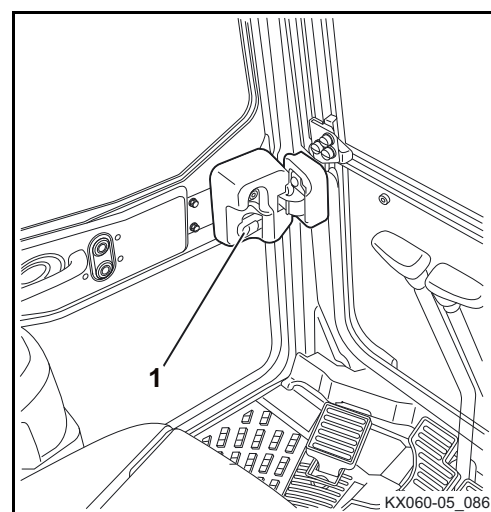
Closing the cab door

- Press down the release lever (1) and pull the cab door into the lock.



Opening the cab door from the inside

- Press down 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

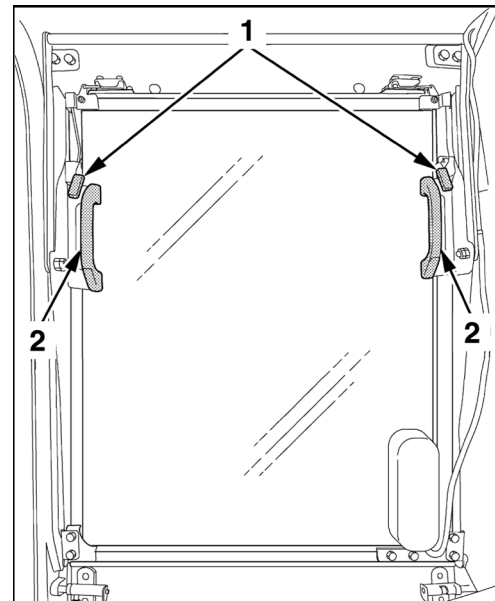
Front window



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



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



Open

- 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.

Close

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

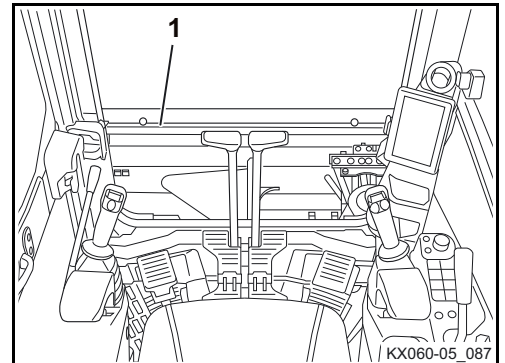
Front window base

Removal



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

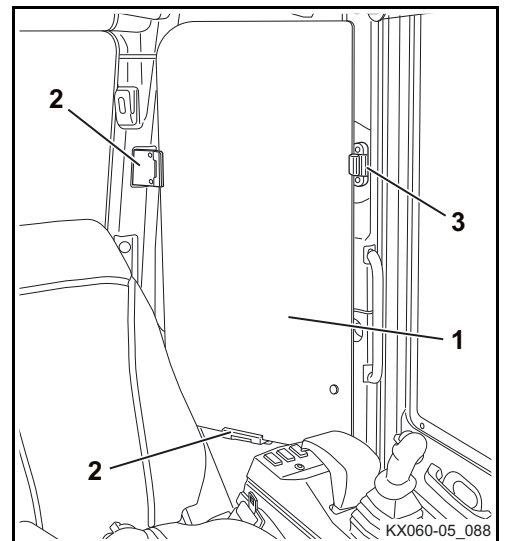
- Lift the front window base (1) upwards to remove it from the window frame.



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



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



Installing

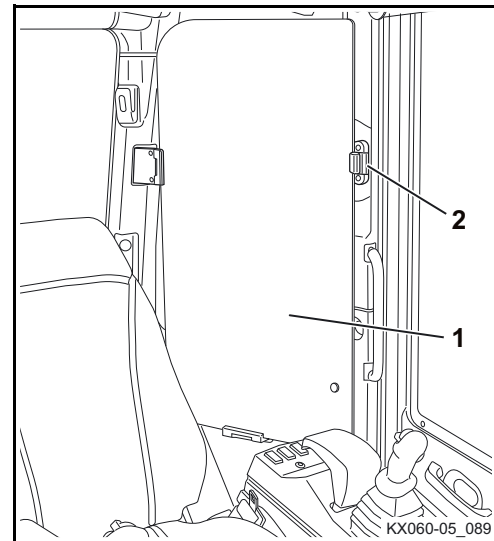


Check that the front window is opened before installing.

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



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

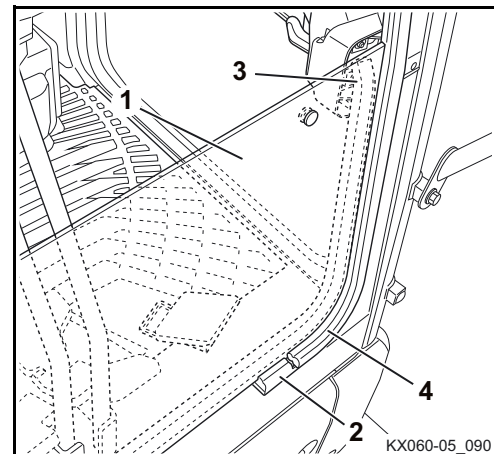


- Carefully slide the front window base (1) from above into the front window frame (3).
- Make sure that the window pane is sliding into position in front of the rubber seal (4).



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

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

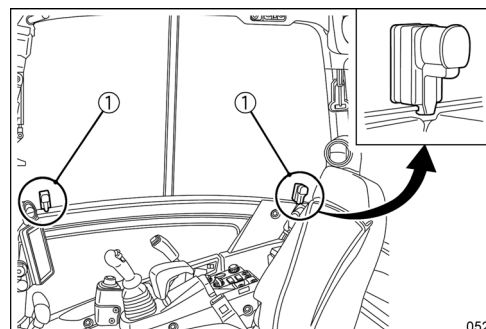


Side window

- Press up the grip (1) to release the lock and pull side window open to the rear or to the front.
- Fit the lock hooks in the window sash grooves. This can get the sliding window locked halfway.



While in operation, preferably get the window locked with either of the grooves.



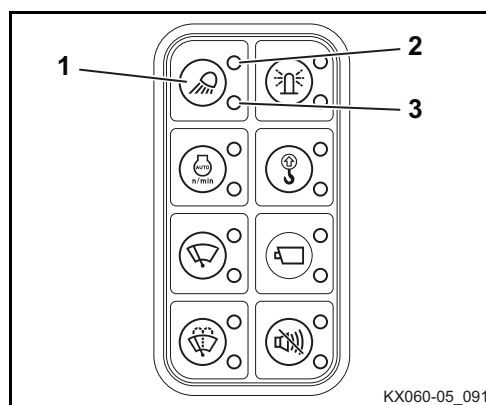
Operating the working light

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

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

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

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



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

Cold weather operation

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

Necessary preparations prior to the winter season

- If necessary, replace the engine oil and hydraulic oil with those of the viscosities specified for winter.
- Only use regular diesel fuel with winter additives. Do not mix petrol and diesel fuel.
- Check the battery's state of charge. In case of extremely low temperatures, it may be necessary to remove the battery after work and store it in a heated room.
- Check the antifreeze strength in the cooling system (page 182). If necessary, add antifreeze until the protection ranges from -25 °C to -40 °C.
- Apply talcum powder or silicone oil to all rubber seals at the windows, the cab door and the side window guide rails.
- Lubricate all locks, except the starter switch, with graphite lubricant.
- Grease the cab door hinges.
- Fill the washer system with a antifreeze window cleaner (page 147).

Operation during the winter season

- The machine must be cleaned after work is finished (page 181); Special attention must be paid to the crawlers, the front attachments and the piston rods of the hydraulic cylinders. If the machine is cleaned with a water jet, it must then be parked in a dry, frost-free and well-ventilated enclosed space.
- If necessary, park the machine on boards or mats in order to prevent freezing to the ground.
- Before starting, check if the piston rods of the hydraulic cylinders are free of ice to avoid damage. Also check if the crawlers are frozen to the ground. If so, do not take the machine into operation.



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

- Start the engine (page 96) and let it run at idle speed until the engine has accommodated to the outside temperature. Before you start working with the front attachments, warm up the machine until the operating temperature is reached.

Jump-starting the machine



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



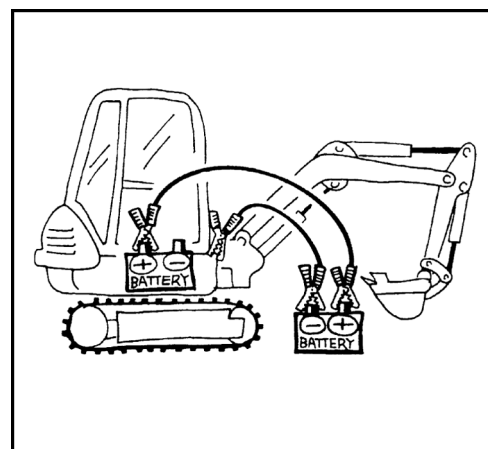
The operator must remain seated on the operator's place, the battery jumper cables must be connected by a second person.

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



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

- Connect the positive terminal of the machine battery with the positive terminal of the helping vehicle (see figure).
- Connect the negative terminal of the helping vehicle to the frame of the machine. Do not use the negative terminal of the machine battery. The connecting point on the frame must be blank and clean.
- Start the helping vehicle and let it run at a higher idle speed.
- Start the engine (page 96) and let it run at idle speed. Check if the charge lamp turns off after starting.
- Disconnect the jumper cable at the frame of the machine first, and then at the negative terminal of the helping vehicle.
- Disconnect the second jumper cable from the positive terminal of the machine battery first, and then from the positive terminal of the helping vehicle.
- Place the positive terminal cover onto the machine battery.
- If the jumper cables will be required for the next start of the machine, check the battery and the alternator's charging circuit, contact skilled personnel, if necessary.



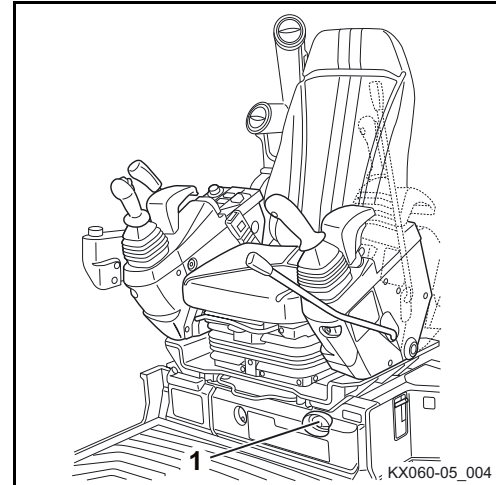
Operating in emergency situations

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

Engine emergency stop

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

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



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



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



Manual lowering of the front attachments

The boom and arm can be lowered in case of an engine failure or if malfunctions occur in the hydraulic system.

- The starter switch is in the RUN position.
- If necessary, lower the boom and the arm with the control levers as described in the "Operating the controls during excavation work" section (page 117).



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



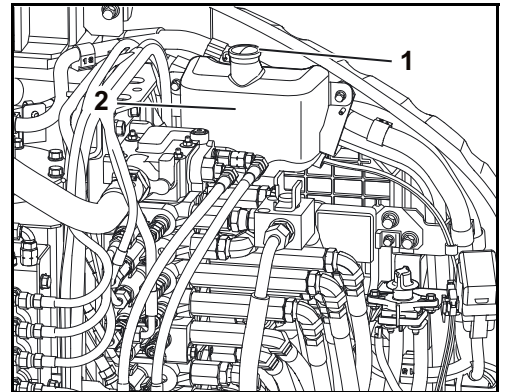
The lowering function is available only for a short time, as it is controlled by the accumulator in the hydraulic system. The cylinders extend or retract by force of gravity.

Filling up the washer system

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



In winter, use a cleaning agent with antifreeze.



Refuelling the machine



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



After refuelling the machine, be sure to tighten the filler cap and close the left service cover.



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



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



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



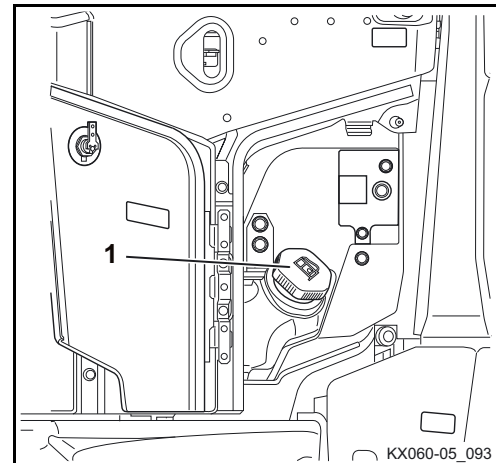
While refuelling, be careful not to allow dust or dirt into the fuel tank.



Always remove spilled fuel immediately.

Refuelling the machine

- Stop the engine.
- Open the left service cover (page 156).
- Remove the filler cap (1) by turning it anticlockwise.
- Fill diesel fuel up to the base of the filler neck.
- Screw on the filler cap and close the service cover.



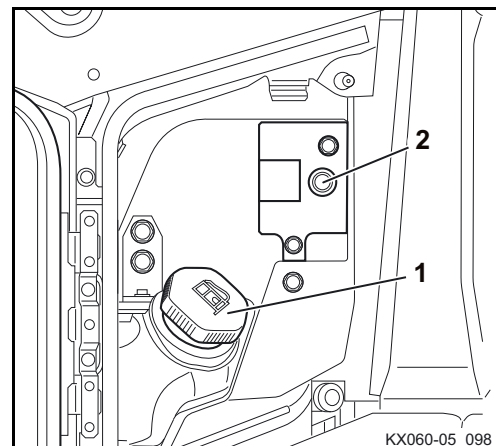
Fill level monitor when refuelling

The momentary fill level during refuelling can be determined by means of an acoustic signal. For this, the starter switch must be in the STOP position.

The switch (2) for the fill level monitor is located above the tank filter neck (1).

- Ensure that the starter switch is switched to the STOP position.
- Press the switch (2).

The fill level monitor is enabled.



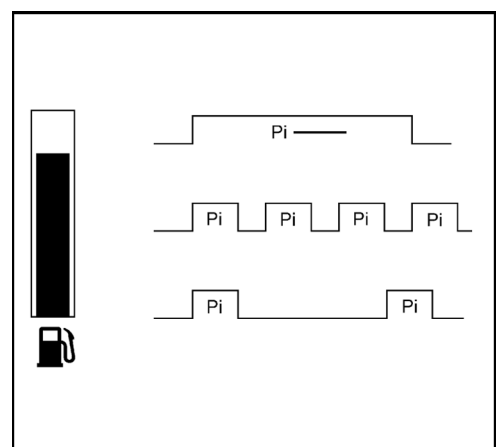
The following signals are output:

Interrupted signal	→ Tank is empty
Periodic signal	→ Tank is being filled
Continuous signal	→ Tank is full



The signal breaks off completely if the flow rate is too low. As soon as there is enough fuel in the tank, the signal restarts.

Press switch (2) after refuelling to deactivate fill level monitoring.



Bleeding the fuel system



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

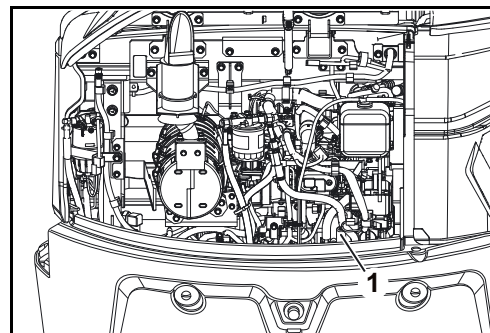
- To bleed the fuel system, move the starter switch to the RUN position.

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

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



If the bleeding isn't successful, press the engine's priming pump (1) repeatedly (10 to 30 times) until there is a noticeable resistance.



Replacing the fuses



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



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



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

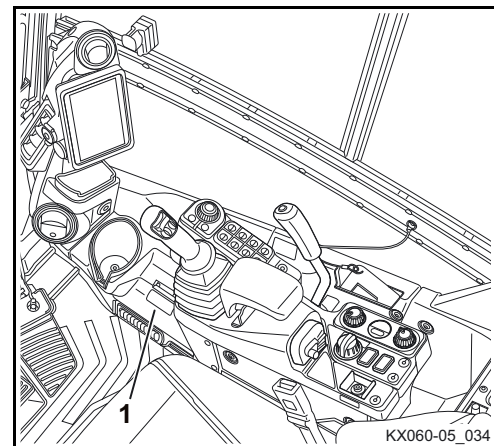


Before replacing the slow-blow fuse and other fuse, turn the starter key on the "STOP" position, stop the engine and disconnect the negative terminal (-) of the battery. Otherwise a spark or the like may result into a dangerous situation.



The main fuses (page 152) of the machine are situated above the battery.

- Remove the fuse box cover (1).

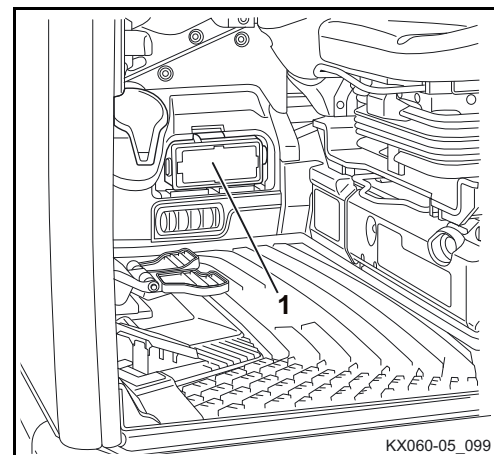


- Remove the burnt out fuse from the fuse box (1) and replace it.

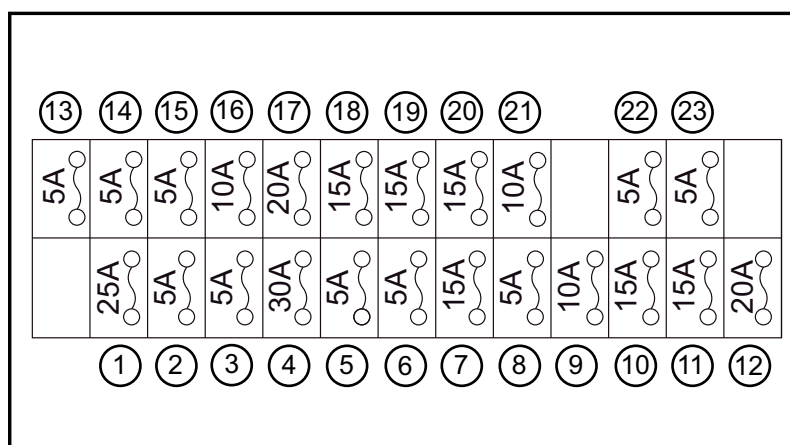


Observe the following fuse box layout!

- The fuse layout is shown in the figure below.



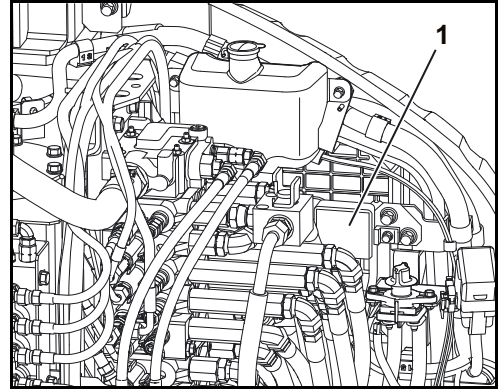
Fuse layout of the fuse box



1	Blower motor	13	ECU Main (AC)
2	A/C Controller	14	Fuel Pump
3	ECU LED (+B)	15	Control lever Lock
4	ECU Main (Power)	16	Alternator
5	Horn Switch	17	Seat
6	Room light	18	12-V electrical outlet
7	Beacon	29	Wiper / Washer
8	K-OBD	20	Radio (AC)
9	Horn	21	Compressor
10	Beacon 2	22	CRS
11	Front Work Light	23	Starter
12	Cab Work Light		

Main fuses

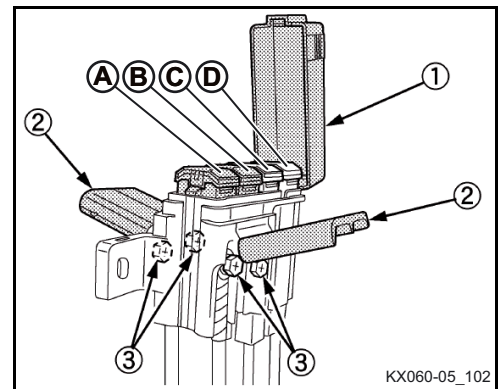
- Disconnect the negative terminal of battery.
- Remove the main fuse box (1).



- Open the main fuse box cap (1) and cover (2) then remove the bolts (3).
- Remove the burnt out main fuse from the main fuse box (1) and replace it.

Fuse layout:

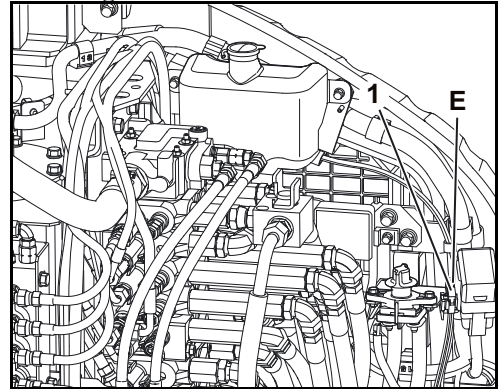
- A → Alternator (80 A)
- C → Main Power (1) (60 A)
- C → Main Power (2) (50 A)
- D → CRS (30 A)



ECU fuse

- Open the mini fuse box cover (1).
- Remove the fuse (E) and replace it.

E → ECU Main (+B) (10 A)



Operating the battery isolator

In order for the machine to be operated, the battery cut-off switch (1) must be in the ON position.

A → OFF

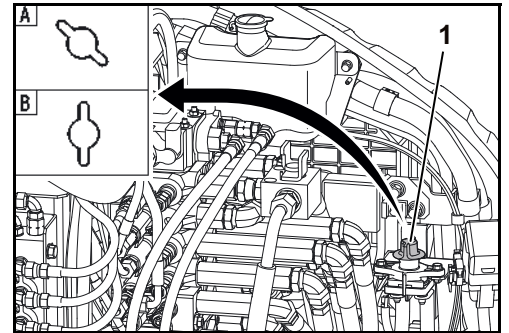
B → ON



If the battery cut-off switch is in the OFF position, most of the electrically powered functions will also be switched off (e.g. horn, fuel fill level monitor, etc.).



The user settings configured on the display will be preserved, the battery discharge is only slight.



Opening and closing the engine compartment cover

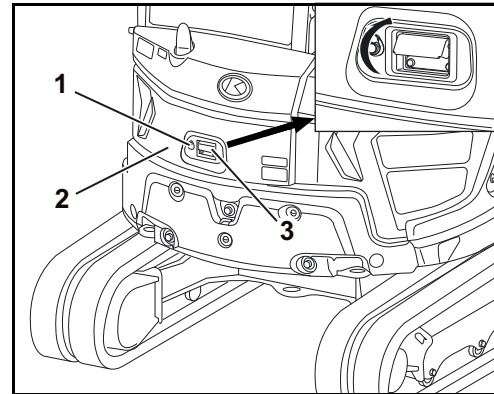


Risk of injury by the engine compartment cover swinging upwards!

Putting up the engine compartment cover is supported by a gas spring. The engine compartment cover can suddenly swing upwards when opening it!

Always hold on to the engine compartment cover while opening it and move it upwards slowly.

- Insert the key into the lock (1) of the engine compartment cover (2), turn it clockwise and then push in the lock cylinder.
- Pull the handle (3) to release the lock of the engine compartment cover. Do not add any force to the opening direction of the engine compartment cover.
- Swing the engine compartment cover all the way up using the handle (3).

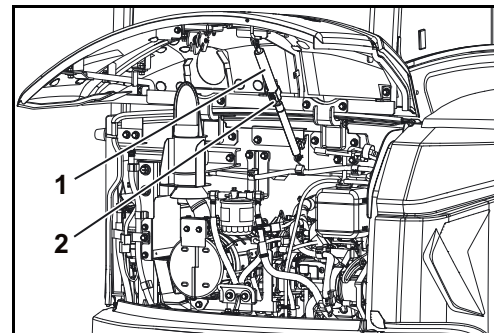


The engine compartment cover is supported by a gas spring that keeps it up once it is open.



Make sure that the stopper (2) is properly engaged at the gas spring (1). If the engine compartment cover is unexpectedly slammed shut, for example by another person or by the wind, serious injury could result.

- To close the engine compartment cover, release the stopper (2) at the gas spring (1) and carefully swing the engine compartment cover down.
- Close the engine compartment cover and press it into the lock.
- Turn the key anticlockwise to lock the engine compartment cover.
- Remove the key.



Make sure that the engine compartment cover is correctly closed.

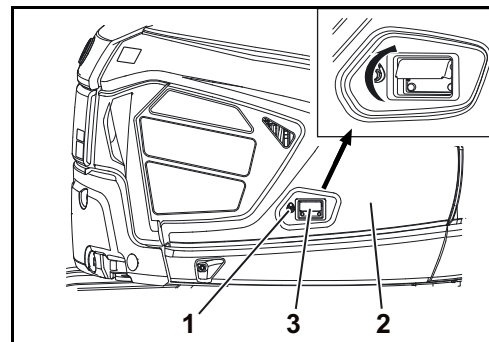
Opening/closing the right side cover



*Risk of injury by side cover swinging upwards!
Putting up the side cover is supported by a gas spring.
The side cover can suddenly swing upwards when opening it!*

- Always hold on to the side cover while opening it and move it upwards slowly.

- Insert the key (1) into the lock of the side cover (2), turn it clockwise and then push in the lock cylinder.
- Pull the handle (3) to release the lock of the side cover. Do not add any force to the opening direction of the side cover.
- Swing the side cover all the way up using the handle (3).

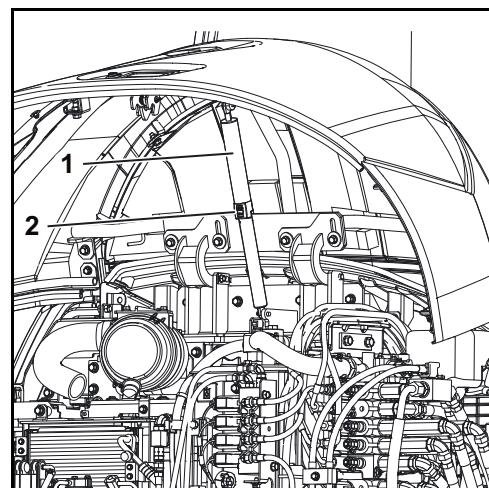


The side cover is supported by a gas spring that keeps it up once it is open.



Make sure that the stopper (2) is properly engaged at the gas spring (1). If the side cover is unexpectedly slammed shut, for example by another person or by the wind, serious injury could result.

- To close the side cover, release the stopper (2) at the gas spring (1) and carefully swing the side cover down.
- Close the side cover and press it into the lock.
- Turn the key anticlockwise to lock the side cover.
- Remove the key.



Make sure that the side cover is correctly closed.

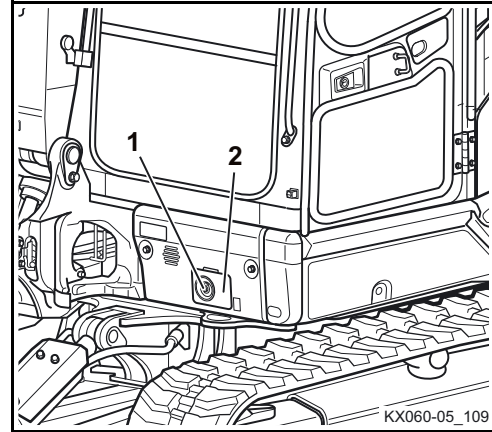
Opening/closing the front service cover

- Insert the key in the lock (1) of the cover (2) and turn it clockwise.
- Open the cover.



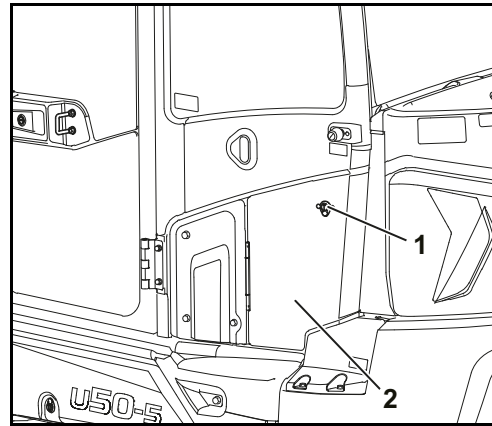
The cover has no catch! The cover falls off upon release, which can lead to hand injuries during clamping.

- To lock the cover, close it again and turn the key anticlockwise.
- Pull out the key.



Opening/closing the left service cover

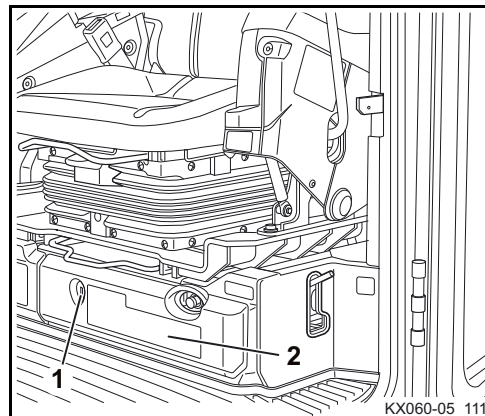
- Insert the key in the lock (1) of the cover (2) and turn it anticlockwise.
- Open the cover.
- To lock the cover, close it again and turn the key clockwise.
- Pull out the key.



Opening/closing the heating and air conditioner unit service cover

- Insert the key in the lock (1) of the cover (2) and turn it anti-clockwise.
- Open the cover.
- To lock the cover, close it again and turn the key clockwise.

Pull out the key.



Replacing the bucket



When replacing the bucket, make sure to wear an eye protection, a helmet and protective gloves.



During attaching and detaching, chippings and burrs may occur at the bolts or bushings. These may cause severe injuries.



Never use your fingers for the alignment of the components (linkage, bucket, arm). The components may sever your fingers by uncontrolled movements.

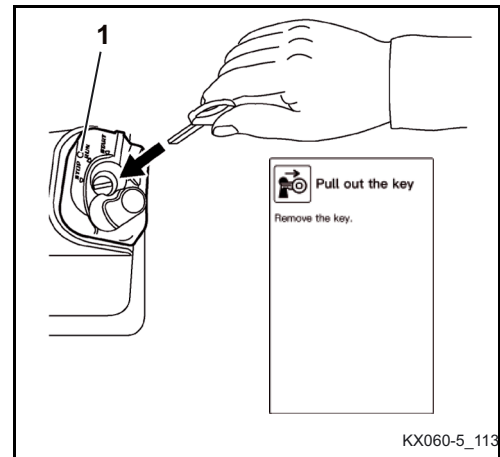
Anti-theft system

The machine is equipped with an anti-theft system that restricts the engine to be started using a registered key only. If a registered key gets lost or stolen, you can invalidate it. This will prevent the engine from being started with this key, thus protecting the vehicle against theft. The anti-theft system makes it difficult to steal the machine.

If the starter switch is set to STOP, the indicator light (1) is illuminated, indicating the activation of the anti-theft system.

Make sure that the indicator light is illuminated when leaving the machine.

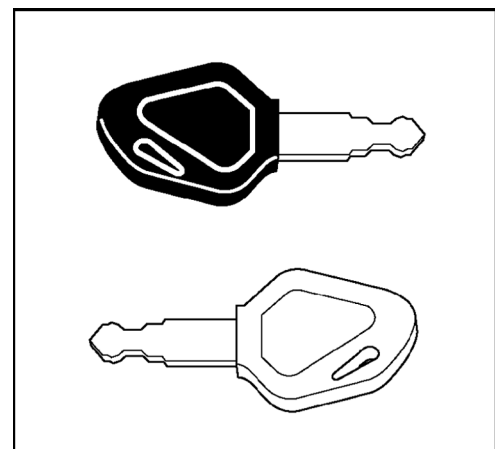
If the starter switch with key inserted is set to STOP when leaving the machine, an acoustic signal will sound as a warning and the message "Pull out the key" is shown in the display.



The vehicle comes with two different types of keys:

Black (individual) key

- This key is used to start the engine.
- The engine can be started by inserting the key and turning it to the START position.
- To be able to start the engine with a black key, it must be registered using the red key.



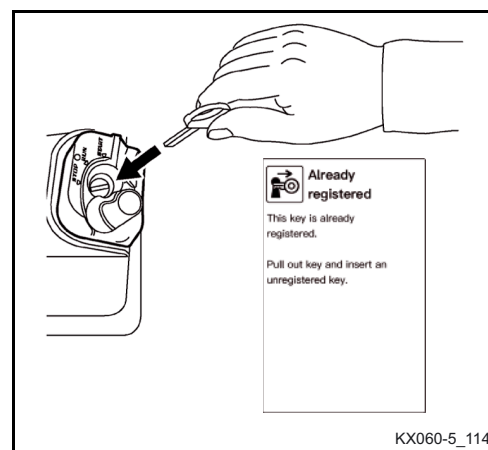
The engine can be started only with a key that was registered for the particular vehicle. The scope of delivery includes two black keys, among them a spare key. The two black keys have already been registered. Up to four keys can be registered.

Red key (for registering)

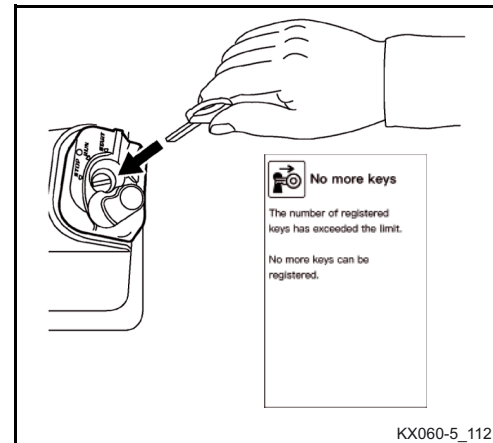
- If one of the black keys is lost, another black key can be registered using the red key (page 160).
- The engine can not be started with the red key.

The key system

- If a registered key is lost, the second and new black key must be re-registered. This procedure locks the lost or stolen black key, which can no longer be used to start the engine.
- If the red key is lost, the black keys can no longer be re-registered. Be sure to keep the red key in a secure location (such as a safe in the office). If it should get lost nevertheless, please contact your authorised dealer immediately.
- If six times attempts are made within one minute to turn the starter switch to the START position with a wrong or unregistered key, an acoustic signal will sound for 30 seconds. The signal will continue to sound even if the starter switch is turned to the STOP position again or the key is removed within this time period. When a key registered for this machine is inserted into the starter switch, the acoustic signal will be turned off.
- Do not use several of these keys in a bunch. This could lead to electrical interfering frequencies which might prevent the motor from starting.
- Use only the special KUBOTA key ring. Other key rings can lead to signal failures between the key and starter switch, and the engine can possibly not start or a key registration cannot be performed.
- After receiving the set of keys, separate them from each other. Always make sure the keys are not part of a bunch. If one of the black keys, for example, is inserted into the starter switch, the red key might be detected by the electronic system. This might lead to a failure of the electronic system.
- If machine malfunctions occur, please contact your KUBOTA dealer immediately in order to have the malfunction localised and remedied.
- Messages in the display can be shown in 11 languages. Your KUBOTA dealer can assist you in your language selection.
- If you erroneously attempt to register a black key that has already been registered, the display will show the "Already registered" message and registration cannot be carried out.



- If you attempt to register a fifth black key, the display will show the "No more keys" message and registration cannot be carried out.



Registering a black key for the machine



Register a black key only under the following conditions:

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

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

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

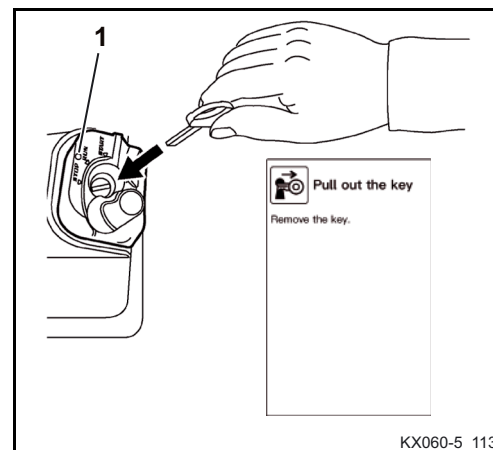
Do not allow the engine to run indoors, unless the room is equipped with an exhaust gas extraction system or otherwise well ventilated. The exhaust gas contains carbon monoxide, a colourless, odourless, and lethal gas.

1. Insert red key into the starter switch.



Do not turn the key at this point. If the key is in the RUN position, turn it back to the STOP position.

2. Press Jog dial (enter switch).
3. The display shows the "Pull out the key" message.

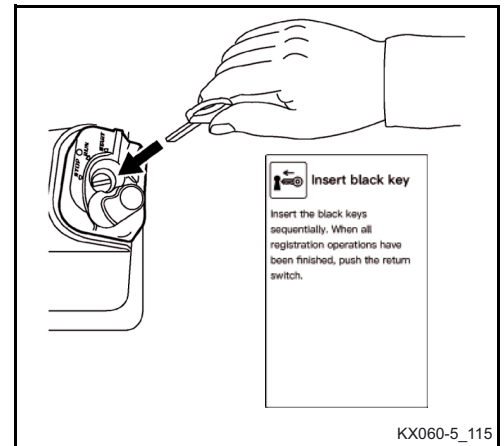


Operation

4. Pull out the red key.
5. The display shows the "Insert the key" message.
6. Insert black key into the starter switch.



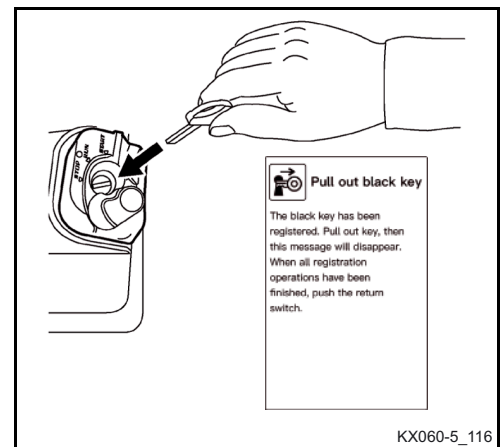
Do not turn the key at this point. If the key is in the RUN position, turn it back to the STOP position.



7. After a brief moment, the display shows the "Pull out black key" message. This message indicates that the black key was registered for the given vehicle.
8. Press the return switch on dial switch to complete registration.
9. One after the other, insert all registered black keys into the starter switch and check whether the engine can be started using these keys.



If a registered black key is lost, the other black keys must be re-registered. This procedure locks the lost or stolen black key, which can no longer be used to start the engine.



TROUBLESHOOTING

The troubleshooting section includes only malfunctions and incorrect operations which must be remedied by the operator. Any other malfunctions may only be eliminated by trained personnel. The troubleshooting must be performed with the aid of the troubleshooting table. In order to locate a malfunction, first look in the MALFUNCTION column for the corresponding machine malfunction. In the POSSIBLE CAUSE column you will find the possible causes for the malfunction. The REPAIR column indicates the required remedial measure. If the fault can not be remedied by the measure indicated in the REPAIR column, consult trained personnel.

Safety rules for troubleshooting

Adhere to the general safety rules (page 13 and the safety rules for operation (page 73).

The operator is not allowed to open the electrical and hydraulic system. These services are reserved for trained personnel.

During troubleshooting, the safety on and around the machine must always be ensured.

If troubleshooting of the machine calls for the bucket being raised, the operator may not stand in the area of the front attachments unless the front attachments are secured against inadvertent lowering by suitable measures.

Troubleshooting: Before operation

MALFUNCTION	POSSIBLE CAUSE	REPAIR
No function available when the starter switch is turned to the RUN position.	Main fuse at battery is blown out	Replace the main fuse (page 152).
Indicator lights do not come on as expected when the starter switch is turned to the RUN position.	Fuse is blown out	Replace the fuses (page 150).
Starter does not turn when the starter switch is turned to the START position.	Drain battery	Charge the battery (page 206). Jump-starting the machine (page 145).
	Engine emergency stop pulled	Push the engine emergency stop (page 30).
	Control lever lock not raised	Raise the control lever lock.
Engine does not start when the starter switch is turned to the START position, but starter turns.	Air in the fuel system	Check the fuel system for leaks and bleed it (page 148).
	Water in the fuel system	Check the water content of the water separator (page 87), drain if necessary (page 192).
	Fuel is too viscous or dirty	Check fuel tank, remove dirt and water (page 195). Check the water separator for dirt and contamination (page 87), clean if necessary (page 193).
Engine runs sluggishly during winter time.	Oil viscosity is too high	Warm up the radiator, e.g. pour hot water on it.

Troubleshooting: Operation

MALFUNCTION	POSSIBLE CAUSE	REPAIR
Insufficient engine power	Air filter restricted	Check, clean and replace the air filter (page 190).
	Fuel filter contaminated or water in fuel system	Check the water separator for water content. Drain it (page 87) and renew the fuel filter (page 191), if necessary.
	Fuel shortage	Check the fuel level (page 89). If necessary, refuel the machine (page 147) and ventilate it (page 149).
No pilot-controlled hydraulic functions available.	Fuse in fuse box is blown out	Replace the fuses (page 150).
	Control lever lock is raised	Lower the control lever lock.
Power of hydraulic functions is too low or disruptive.	Hydraulic oil level too low	Check the hydraulic oil level, add hydraulic oil (page 86).
	Suction filter restricted	Change the suction filter in the hydraulic oil tank (page 200).
	Hydraulic hoses or connections are leaking	Must be replaced. Inform your KUBOTA dealer.
Travel speed button does not work.	Fuse in fuse box is blown out	Replace the fuses (page 150).
Heater fan, wiper/washer system, interior light, horn, working light not operating.	Fuse in fuse box is blown out	Replace the fuses (page 150).
Indicator for the AUTO IDLE switch lights up.	Fuse in fuse box is blown out	Replace the fuses (page 150).
Exhaust gas colour very black.	Fuel quality is low	Use fuel as indicated in the "Operating materials" table (page 180).
	Engine oil level is too high	Check engine oil level, drain engine oil until it reaches specified level if necessary (page 189).
	Air filter restricted	Check, clean and replace the air filter (page 190).
The engine stops suddenly.	Fuel shortage	Check the fuel level (page 89). If necessary, refuel the machine (page 147) and ventilate it (page 149).

MALFUNCTION	POSSIBLE CAUSE	REPAIR
Coolant temp. is too high.	Water pump seal is damaged	Must be replaced. Inform your KUBOTA dealer.
	V-belt is damaged or very loose	Replace and/or tension it (page 185).
	Thermo switch is failed	Must be replaced. Inform your KUBOTA dealer.
	Coolant level too low	Refill coolant (page 182).
	Leaky cooling system components	Check the cooling system for leaks, see the "Changing the Coolant" section (page 182).
	Dirty radiator and/or condenser	Clean the radiator and condenser (page 85).
	Cylinder head seal is damaged	Must be replaced. Inform your KUBOTA dealer.
	Engine oil level is too low	Check the engine oil level, add engine oil if necessary (page 189).
	Fuel quality is low	Use fuel as indicated in the "Operating materials" table (page 180).
	Particles of rust from cylinder head or crankcase in coolant	Change coolant (page 182). Add anti-rust additive.
	Radiator cap is damaged	Must be replaced. Inform your KUBOTA dealer.
	Coolant lines corroded	Must be replaced. Inform your KUBOTA dealer.
	Constant operation at full capacity	Reduce load.
	Fuel injection time inaccurate	Must be adjusted. Inform your KUBOTA dealer.
Deviation in driving direction of machine.	Crawler tension adjusted incorrectly	Check and adjust the crawler tension, if necessary (page 210).
	Blocked by stones	Remove the stones.

Troubleshooting: Display indications



If the machine develops a fault, one of the following messages will appear on the display. In the event of problems, please inform your KUBOTA dealer immediately.

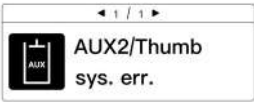
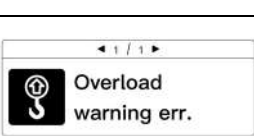
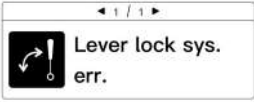
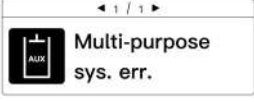
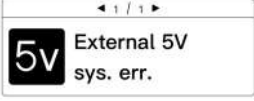
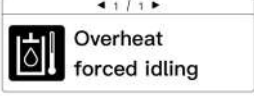
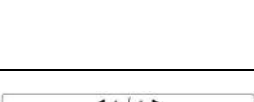
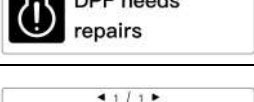
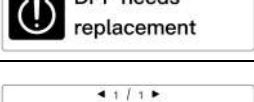
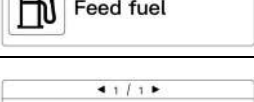


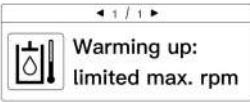
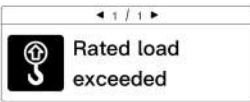
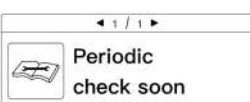
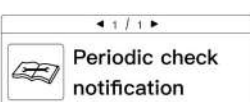
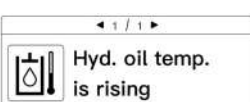
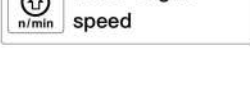
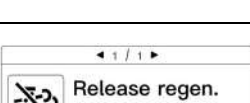
It is essential to take prompt action to rectify any incorrect operation, use or maintenance of the emission control system in accordance with rectification as specified in the solution column.



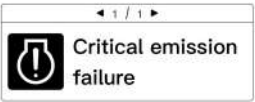
You can view detailed information by pressing the Jog dial (enter switch). Inform your KUBOTA dealer which messages appeared in the display.

No.	indicator	Problem/Error	Preliminary Measure	Solution
1.	 Engine oil pressure err.	Engine oil pressure is too low. Engine may burn out.	Stop the engine immediately. The engine may have developed a fault.	Inform your KUBOTA dealer immediately.
2.	 Overheat forced idling	Coolant temp. is too high. Engine will automatically reduce engine speed for cooling.	Allow the machine to cool off by idling. Do not switch the engine off as the coolant could then boil over.	Clean the radiator and check the coolant, top up if necessary. Check the hydraulic system for leaks; if necessary, contact your KUBOTA dealer.
3.	 Charging sys. err.	Problem with charging system. The machine will work until the battery dies.	Check the V-belt. When the V-belt is OK, let the engine run until indicator goes out.	If the indicator does not turn off, immediately inform your KUBOTA dealer.
4.	 Fuel sensor err.	Fuel sensor system is in trouble. Fuel level indicator doesn't appear on meter.	-	Inform your KUBOTA dealer immediately.
5.	 CAN sys. err.	Problem with communication (CAN) system. Some meter readings may be erroneous or some switches may malfunction.	The machine can be started and driven. Do not perform any work with the machine.	Inform your KUBOTA dealer immediately.
6.	 Fuel mixed with water	Fuel was mixed with water. There is a risk of serious engine damage.	Immediately drain the water from fuel system after stopping engine. Risk of damage to the engine.	Check and separate water from the fuel filter and clean the water separator. If the indicator lights up again, immediately contact your KUBOTA dealer.
7.	 2-speed sys. err.	Problem with 2-speed system.	The machine will still run at low speed but will not switch to high speed.	Inform your KUBOTA dealer immediately.
8.	 AUX1 sys. err.	Problem with AUX1 system.	If systems other than AUX1 system function, work can be continued.	Inform your KUBOTA dealer immediately.

No.	indicator	Problem/Error	Preliminary Measure	Solution
9.	 AUX2/Thumb sys. err.	Problem with AUX2 / Thumb system.	If systems other than AUX2 / Thumb system function, work can be continued.	Inform your KUBOTA dealer immediately.
10.	 Overvoltage	Charging voltage is too high. There may be a problem with the electric device.	Switch the engine off immediately and check the battery and the alternator. Restart the engine.	If the indicator lights up again after restarting, immediately contact your KUBOTA dealer.
11.	 Overload warning err.	Problem with overload warning system.	If systems other than overload warning system function, work can be continued.	Inform your KUBOTA dealer immediately.
12.	 Auto idle sys. err.	Auto idle system and accelerator have failed.	Accelerator will not function, but other functions are still operational.	Inform your KUBOTA dealer immediately.
13.	 Lever lock sys. err.	Problem with lever lock system.	Engine can run, but machine fails to move.	Inform your KUBOTA dealer immediately.
14.	 Multi-purpose sys. err.	Problem with multi-purpose system.	If systems other than multi-purpose system function, work can be continued.	Inform your KUBOTA dealer immediately.
15.	 5v External 5V sys. err.	Sensor's 5V power supply has short-circuited.	Majority of systems have failed.	Inform your KUBOTA dealer immediately.
16.	 Overheat forced idling	Hyd. oil temperature is too high. Engine will automatically reduce engine speed for cooling.	Do not stop engine until the hydraulic oil cool down.	Clean the oil cooler and check the hydraulic oil, top up if necessary. Check the hydraulic system for leaks; if necessary, contact your KUBOTA dealer.
17.	 DPF needs repairs	DPF is clogged. DPF must be repaired.	-	Inform your KUBOTA dealer immediately.
18.	 DPF needs replacement	DPF must be replaced.	-	Inform your KUBOTA dealer immediately.
19.	 Feed fuel	Fuel is running out.	-	Refuel the machine.
20.	 Water temp. is rising	Water temperature is rising somewhat higher than specified.	Check the radiator and other components for clogs. Immediately clean them.	-

No.	indicator	Problem/Error	Preliminary Measure	Solution
21.	 Warming up: limited max. rpm	Hyd. oil temp. is too low. Engine is revved up only to the medium rpm for warming-up.	-	-
22.	 Rated load exceeded	Load to be lifted is too heavy.	The overload warning ap- plies only to lifting loads. Deactivate the overload warning during other types of work (e.g. exca- vating) by pressing the overload warning switch.	Lower load and reduce its weight.
23.	 Periodic check soon	10 hours until periodic check interval.	Operate the machine as usual.	Ask your KUBOTA dealer for relevant parts and use them to replace existing parts.
24.	 Periodic check notification	Periodic check interval has passed.	The machine can be op- erated but service must be carried out urgently.	Ask your KUBOTA dealer for relevant parts and use them to replace existing parts.
25.	 Hyd. oil temp. is rising	Hyd. oil temp. is rising somewhat higher than specified.	Check the oil cooler and other components for clogs. Immediately clean them.	-
26.	 Regenerating	DPF is regenerating. This is a normal maintenance activity. Exhaust temp. is rising. It is possible to work with careful operation.	-	-
27.	 Raise engine speed	DPF must be regenerat- ed.	-	Raise engine speed and start the particle filter re- generation. If the indicator lights up again, immediately con- tact your KUBOTA deal- er.
28.	 Release regen. inhibition	DPF must be regenerat- ed.	-	Drive the machine to a safe place and release the particle filter regener- ation. If the indicator lights up again, immediately con- tact your KUBOTA deal- er.
29.	 Engine output is limited	DPF is regenerating. En- gine output is limited to prevent engine problems.	-	Keep raising engine speed and finish DPF re- gen. process.
30.	 Raise engine speed	DPF must be regenerat- ed immediately. Engine output is limited to prevent engine prob- lems.	-	Raise engine speed and start the particle filter re- generation. If the indicator lights up again, immediately con- tact your KUBOTA deal- er.

No.	indicator	Problem/Error	Preliminary Measure	Solution
31.	Release regen. inhibition	DPF must be regenerated immediately. Engine output is limited to prevent engine problems.	-	Drive the machine to a safe place and release the particle filter regeneration. If the indicator lights up again, immediately contact your KUBOTA dealer.
32.	Engine stop for DPF protection	Engine was stopped automatically to protect DPF.	-	After turning off and re-starting engine, rev up engine to start DPF regen.
33.	Needs setup	Setup is required. Functions may not work.	-	Inform your KUBOTA dealer.
34.	Stop button is activated	Engine cannot be started.	-	Press the engine stop button before starting engine.
35.	Wrong key: Unable to start	Key is incorrect. Engine will not start.	-	Start engine with correct key.
36.	Red key: Unable to start	Cannot start with red key. Engine will not start.	-	Start engine with correct key.
37.	Hyd. temp. sensor err.	Problem with hyd. oil temp. sensor system.	Meter does not show hyd. oil temp., and overheating cannot be detected.	Inform your KUBOTA dealer immediately.
38.	DPF cleaning soon	DPF will need cleaning soon.	Operate the machine as usual.	Contact your KUBOTA dealer to clean DPF.
39.	DPF cleaning required	DPF needs cleaning.	-	Contact your KUBOTA dealer to clean DPF.
40.	Preheating	Engine is preheating.	-	Wait until this message disappears, and then start engine.
41.	Fasten seatbelt	There is a risk of serious injury or death.	-	Fasten seatbelt.
42.	3-way valve sys. err.	Problem with 3-way valve system.	If systems other than 3-way valve system function, work can be continued.	Inform your KUBOTA dealer immediately.
43.	Engine sys. err.	Malfunctions in the Common Rail System.	-	Inform your KUBOTA dealer immediately.

No.	indicator	Problem/Error	Preliminary Measure	Solution
44.	 Critical emission failure	Malfunctions in the particulate control device (PCD) / NOx control device (NCD).	Engine control is not working properly.	Immediately contact your KUBOTA dealer of the emergency repair.

MAINTENANCE

The "Maintenance" section includes all care and maintenance tasks to be performed on the machine.

A careful maintenance of the machine will guarantee functional safety and longer service life.

Neglect of the servicing will void the warranty and any liability by KUBOTA.

Only use spare parts that are recommended by the manufacturer. Non-approved spare parts of inferior quality or wrong classification result in an increased risk of accidents. Operators using non-approved spare parts are fully responsible for any damage arising thereof.

Safety rules for maintenance

- The operator must provide persons who work with or on the machine with suitable personal protective equipment (PPE) and those persons must use that equipment where applicable, for example: suitable working clothes, safety shoes, safety helmets, eye protection, ear protection and breathing masks. The owner/employer bears the main responsibility for the PPE, which is specified by the safety rules for particular types of activity.
- Maintenance, cleaning and care activities may only be carried out if the machine is fully shut down. The machine must be secured against restarting by removing the ignition key.
- The bucket and the dozer must always be lowered to the ground for servicing.
- When failures are detected during servicing or maintenance, the machine may only be operated after the failures have been repaired. Repairs may only be carried out by trained personnel.
- When carrying out maintenance and care activities, always make sure that the machine is secured and stable.
- Before getting under the machine for servicing and inspection reasons, make sure that the attachment control lock lever is locked and that anti-drop safety blocks and/or safety supports are in place.
- When working on the fuel system, smoking, open flames and the operation of other ignition sources are not allowed. The danger zone has to be clearly marked with signs. A fire extinguisher must be kept at hand in the danger zone.
- All waste materials must be discarded in accordance with environmental protection regulations.
- Use the maintenance and care materials listed in the "Operating materials" section (page 180).
- When working on the electrical system, disconnect it from the voltage source before starting the work. The work may only be carried out by technicians with electrical training.
- Always use a ladder or a scaffold if the work cannot be reached by the operator.
- The controls may only be used while the operator is sitting on the operator's seat.

Personnel requirements

- The operator may only carry out cleaning and care activities.
- The servicing may only be performed by trained personnel.

Repair work on the machine

Repairs on the machine may only be carried out by trained personnel.

If repairs are carried out on load supporting parts, for example welding on frame parts, the work has to be checked by a qualified person.

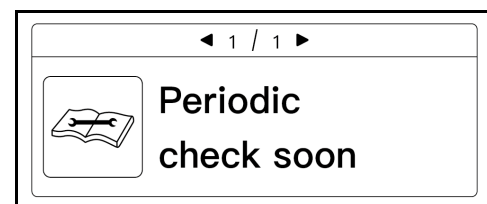
After repairs, the machine should be operated only if it is functioning properly. For this check particular attention must be paid to the repaired parts and the safety devices.

Maintenance intervals

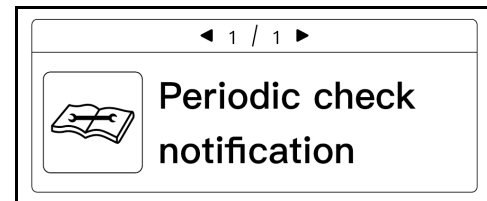
Maintenance interval display

10 hours before a certain service interval is due, the respective maintenance interval is already indicated on the display.

The adjacent figure shows the “Periodic check soon” message.



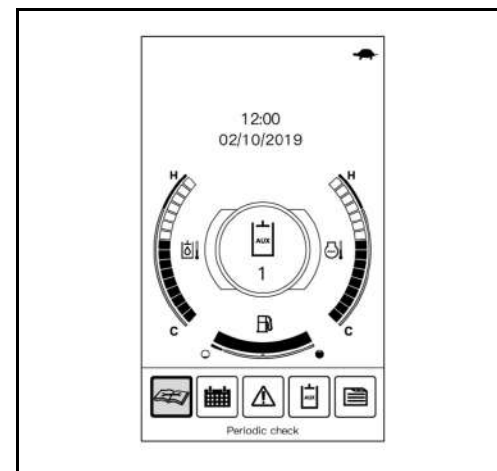
Once the time for a service interval has been reached or exceeded, the “Periodic check notification” message appears on the display.



- Press menu switch on dial switch.

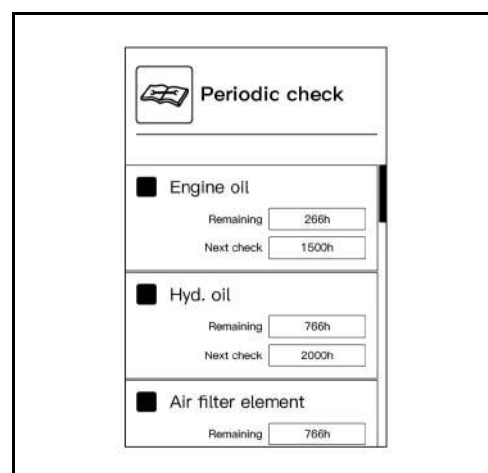
The menu bar appears in the display.

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



The list of "Periodic check" check points appears in the display .

- To rotate jog dial can be used to scroll up and down through the list of maintenance points.



The maintenance points illustrated in the following table are set in the service period indicator.

No.	Maintenance point	Task	Elapsed hours of operation										Interval
			50	100	250	500	600	750	1000	1500	2000	3000	
1	Engine oil	Change				○			○	○	○	○	500 h
2	Fuel filter	Change				○			○	○	○	○	500 h
3	Engine oil filter	Change				○			○	○	○	○	500 h
4	Breather filter	Change				○			○	○	○	○	500 h
5	Drive unit oil	Change	●			○			○	○	○	○	500 h
6	Hydraulic oil	Change							○		○	○	1000 h
7	Air filter element	Change							○		○	○	1000 h
8	Return Filter	Change							○		○	○	1000 h
9	Suction filter	Change							○		○	○	1000 h
10	Pilot circuit filter	Change							○		○	○	1000 h
11	Oil separator element	Change								○		○	1500 h
12	Oil in idler and track roller	Change									○		2000 h

The maintenance tasks denoted with ● must be carried out once the specified hours of operation after initial commissioning have been reached.



The machine's engine features an exhaust purification system. The engine must be operated, used and serviced according to the following provisions in order to maintain the emission performance.

- Only use the fuel recommended in these operating instructions.
- Only use the engine oil recommended in these operating instructions.
- Service the engine according to the intervals recommended in these operating instructions.
- Replace the engine-related components according to the intervals recommended in these operating instructions.

General maintenance chart: 50 to 500 hours of operation

Operator servicing

Servicing	Tasks	Elapsed hours of operation											
		50	100	150	200	250	300	350	400	450	500	Interval	Page
Walk-around inspection	Check											daily	83
Dust valve	Clean											daily	84
Engine oil level	Check											daily	84
Coolant level	Check											daily	84
Radiator and A/C condenser	Check											daily	85
V-belt	Check											daily	85
Exhaust system leakage	Check											daily	86
Hydraulic oil level	Check											daily	86
Water separator	Check											daily	87
Bucket bolt and linkage bolt	Grease											daily	87
Lubricate the front attachments	Swing bracket	Grease										daily	209
	Other greasing points	Grease										daily	209
Fuel level	Check											daily	89
Fluid level of the wiper/washer system	Check											daily	147
Electrical instrumentation	Check											daily	88
Fuel tank	Drain	○	○	○	○	○	○	○	○	○	○	50 h	195
Battery	Check	○	○	○	○	○	○	○	○	○	○	50 h	205
Swivel gear	Grease	○	○	○	○	○	○	○	○	○	○	50 h	208
Crawler tension	Check	○	○	○	○	○	○	○	○	○	○	50 h	211
	Adjust	○	○	○	○	○	○	○	○	○	○	50 h	211
Water separator	Clean	○	○	○	○	○	○	○	○	○	○	50 h	193
Swivel ball bearing	Grease				○				○			200 h	208
Interior air filter 1., 2.)	Check			○			○			○		150 h	212
	Check			○			○			○		150 h	212
Air filter 1.)	Check				○			○				200 h	190
	Clean				○			○				200 h	186
Coolant hoses and hose clamps	Check				○			○				200 h	186
Fuel lines and air intake hoses	Check				○			○				200 h	196

- 1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
- 2.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

General maintenance chart: 550 to 1000 hours of operation

Operator servicing

Servicing		Tasks	Elapsed hours of operation										Interval		Page
			550	600	650	700	750	800	850	900	950	1000			
Walk- around inspection		Check											daily	83	
Dust valve		Clean											daily	84	
Engine oil level		Check											daily	84	
Coolant level		Check											daily	84	
Radiator and A/C condenser		Check											daily	85	
V-belt		Check											daily	85	
Exhaust system leakage		Check											daily	86	
Hydraulic oil level		Check											daily	86	
Water separator		Check											daily	87	
Bucket bolt and linkage bolt		Grease											daily	87	
Lubricate the front attach-ments	Swing bracket	Grease											daily	209	
	Other greasing points	Grease											daily	209	
Fuel level		Check											daily	89	
Fluid level of the wiper/washer system		Check											daily	147	
Electrical instrumentation		Check											daily	88	
Fuel tank		Drain	○	○	○	○	○	○	○	○	○	○	50 h	195	
Battery		Check	○	○	○	○	○	○	○	○	○	○	50 h	205	
Swivel gear		Grease	○	○	○	○	○	○	○	○	○	○	50 h	208	
Crawler tension		Check	○	○	○	○	○	○	○	○	○	○	50 h	211	
		Adjust	○	○	○	○	○	○	○	○	○	○	50 h	211	
Water separator		Clean	○	○	○	○	○	○	○	○	○	○	50 h	193	
Swivel ball bearing		Grease		○				○				○	200 h	208	
Interior air filter1., 2.)		Check		○			○			○			150 h	212	
		Check		○			○			○			150 h	212	
Air filter1.)		Check		○				○				○	200 h	190	
		Clean		○				○				○	200 h	186	
Coolant hoses and hose clamps		Check		○				○				○	200 h	186	
Fuel lines and air intake hoses		Check		○				○				○	200 h	196	

- 1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
- 2.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Servicing maintenance chart: 50 to 500 hours of operation

Servicing by skilled personnel or KUBOTA dealer

Servicing	Tasks	Elapsed hours of operation *										Interval	Page
		50	100	150	200	250	300	350	400	450	500		
V-belt	Adjust					○					○	250 h	185
	Change	Please contact your KUBOTA dealer.										500 h	185
Water separator filter	Change										○	500 h	194
Engine oil and oil filter	Change										○	500 h	188
Drive unit oil 2.)	Change	●									○	500 h	212
Fuel filter	Change										○	500 h	191
Tank breather filter	Change										○	500 h	198
Return filter 4.)	Change											1000 h	197
Pilot circuit filter	Change											1000 h	199
Hydraulic oil and suction filter 4.)	Change											1000 h	200
Air filter 1.)	Change											1000 h	190
Interior air filter 1., 6.)	Change											600 h	212
Engine valve clearance	Check	Please contact your KUBOTA dealer.										1000 h	--
Oil separator element	Change	Please contact your KUBOTA dealer.										1500 h	--
EGR cooler	Check	Please contact your KUBOTA dealer.										1500 h	--
Oil in idler and track roller	Change	Please contact your KUBOTA dealer.										2000 h	--
Alternator and starter monitor	Check	Please contact your KUBOTA dealer.										2000 h	--
EGR system	Check	Please contact your KUBOTA dealer.										3000 h	--
Turbo charger	Check	Please contact your KUBOTA dealer.										3000 h	--
Diesel particle filter 5.)	Clean	Please contact your KUBOTA dealer.										6000 h	--
Engine and electrical	Check	Please contact your KUBOTA dealer.										Annually	--
Safety inspection 3.)	Check											Annually	221
Boost sensor and air flow sensor	Check	Please contact your KUBOTA dealer.										Annually	--
Condition of DPF muffler	Check	Please contact your KUBOTA dealer.										Annually	--
DPF differential pressure sensor and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
DPF exhaust gas temperature sensor	Check	Please contact your KUBOTA dealer.										Annually	--
EGR and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
Pipes and hoses of the air conditioner	Check	Please contact your KUBOTA dealer.										Annually	
	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant hoses and hose clamps	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Fuel lines and air intake hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant	Change											Every 2 years	187
Cooling system	Flush	Please contact your KUBOTA dealer.										Every 2 years	--
Oil separator rubber hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--

Servicing	Tasks	Elapsed hours of operation *										Interval	Page
		50	100	150	200	250	300	350	400	450	500		
DPF differential pressure sensor (front and rear)	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Suction pipe downstream from air flow sensor	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Boost sensor rubber hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
EGR cooler hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Hydraulic hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant content	Check	Please contact your KUBOTA dealer.										Maintenance on demand	215

* The servicing identified with ● must be carried after the specified hours of operation after initial operation have been reached.

- 1.) Under very dusty conditions, the air filter and the interior air filter must be cleaned more frequently or replaced.
- 2.) Earlier if necessary.
- 3.) At least annually.
- 4.) When using a breaker over 20 % → every 800 h.
When using a breaker over 40 % → every 400 h.
When using a breaker over 60 % → every 300 h.
When using a breaker over 80 % → every 200 h.
- 5.) The machine features a warning system for the DPF cleaning.
The diesel particle filter should be cleaned in the event of a warning or every 6000 operating hours.
- 6.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Servicing maintenance chart: 550 to 1000 hours of operation

Servicing by skilled personnel or KUBOTA dealer

Servicing	Tasks	Elapsed hours of operation *										Interval	Page
		550	600	650	700	750	800	850	900	950	1000		
V-belt	Adjust					○					○	250 h	185
	Change	Please contact your KUBOTA dealer.										500 h	185
Water separator filter	Change										○	500 h	194
Engine oil and oil filter	Change											500 h	188
Drive unit oil 2.)	Change										○	500 h	212
Fuel filter	Change										○	500 h	191
Tank breather filter	Change										○	500 h	198
Return filter 4.)	Change										○	1000 h	197
Pilot circuit filter	Change										○	1000 h	199
Hydraulic oil and suction filter 4.)	Change										○	1000 h	200
Air filter 1.)	Change										○	1000 h	190
Interior air filter 1., 6.)	Change		○									600 h	212
Engine valve clearance	Check- ing	Please contact your KUBOTA dealer.										1000 h	--
Oil separator element	Change	Please contact your KUBOTA dealer.										1500 h	--
EGR cooler	Check	Please contact your KUBOTA dealer.										1500 h	--
Oil in idler and track roller	Change	Please contact your KUBOTA dealer.										2000 h	--
Alternator and starter monitor	Check	Please contact your KUBOTA dealer.										2000 h	--
EGR system	Check	Please contact your KUBOTA dealer.										3000 h	--
Turbo charger	Check	Please contact your KUBOTA dealer.										3000 h	--
Diesel particle filter 5.)	Clean	Please contact your KUBOTA dealer.										6000 h	--
Engine and electrical	Check	Please contact your KUBOTA dealer.										Annually	--
Safety inspection 3.)	Check											Annually	221
Boost sensor and air flow sensor	Check	Please contact your KUBOTA dealer.										Annually	--
Condition of DPF muffler	Check	Please contact your KUBOTA dealer.										Annually	--
DPF differential pressure sensor and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
DPF exhaust gas temperature sensor	Check	Please contact your KUBOTA dealer.										Annually	--
EGR and tubes for gas leakage	Check	Please contact your KUBOTA dealer.										Annually	--
Pipes and hoses of the air conditioner	Check	Please contact your KUBOTA dealer.										Annually	
	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant hoses and hose clamps	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Fuel lines and air intake hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant	Change											Every 2 years	187
Cooling system	Flush	Please contact your KUBOTA dealer.										Every 2 years	--
Oil separator rubber hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--

Servicing	Tasks	Elapsed hours of operation *										Interval	Page
		550	600	650	700	750	800	850	900	950	1000		
DPF differential pressure sensor (front and rear)	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Suction pipe downstream from air flow sensor	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Boost sensor rubber hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
EGR cooler hose	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Hydraulic hoses	Change	Please contact your KUBOTA dealer.										Every 2 years	--
Coolant content	Check	Please contact your KUBOTA dealer.										Maintenance on demand	215

* The servicing identified with ● must be carried after the specified hours of operation after initial operation have been reached.

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- 6.) If you feel a drop in the air-conditioner airflow, replace the interior air filter with a new one, regardless of its replacement intervals.

Operating materials

		Ambient temperature conditions	Recommendation		Filled at the factory		Note
			Viscosity	Quality standard	Brand	Type	
Engine oil	Engine	above 25 °C (77 °F)	SAE 30 SAE 10W-30 SAE 15W-40	API CJ-4 API CK-4	JXTG	JASO DH2 SAE 10W-30	Do not mix with other oils.
		0 °C to 25 °C (32 °F to 77 °F)	SAE 20 SAE 10W-30 SAE 15W-40				
		below 0 °C (32 °F)	SAE 10W SAE 10W-30 SAE 15W-40				
	Front idler		SAE 30	API CD	-	API CD SAE 30	Do not mix with other oils.
	Truck roller		ISO VG 220	-	-	ISO VG 220	Do not mix with other oils.
Coolant			-	SAE J1034 MB 325.0 ASTM D3306 ASTM D4985	KUBOTA	LLC-N-50F Mixing ratio 50 %	Always use distilled water to mix with antifreeze. Always follow the recommendations of the coolant manufacturer for the mixing ratio. Do not mix with other coolants.
Grease	Bolts, bushings, gears	NLGI-2	DIN 51825 KP2K-30	COSMO	Dynamax EP2	JCMAS GK verified NLGI-2 grease can also be used.*	
				IDEMITSU	Daphne Grease MP No.2		
Hydraulic oil	In winter and/or at low temperatures	ISO VG 32 ISO VG 46	-	SHELL	Tellus S2M46 ISO VG 46	JCMAS HK verified oil can also be used.* Do not mix with other oils.	
	In summer and/or at high ambient temperatures	ISO VG 46 ISO VG 68					
Biodegradable Hydraulic oil (Option)		ISO 15380	Panolin	HLP SYNTH 46		Less than 2 % mineral oil remains in the system as per ISO 15380.	
Gear oil	Drive unit	SAE 90	API GL-4	-	API GL-4 SAE 90	Do not mix with other oils.	
Fuel**			-	EN 590	-	-	The fuel filled at the factory is not winter diesel. For preparing the machine for use in winter, fill the fuel tank with winter diesel and allow the engine to run for a few minutes.
Refrigerant			-	HFC-134a (R134a)	-	HFC-134a (R134a)	-

* Further information can be found on Japan Lubricating Oil Society's website (JALOS).

** A fuel with sulphur content not greater than 10 mg/kg (20 mg/kg at point of final distribution) a cetane number not less than 45 and a fatty acid methyl ester (FAME) content not greater than 7 % volume per volume (v/v) shall be used.

Cleaning the machine



Before cleaning, shut down the engine and secure it against starting.



If a steam cleaner is used for cleaning the machine, do not direct the steam jet at electric components.



Do not direct a water jet into the intake opening of the air filter.



Do not clean the machine with inflammable liquids.



The machine may only be washed at suitable places (using oil and grease separators).

The machine can be cleaned with water and a commercial cleaning agent. Make sure no water gets into the electrical system.

Use a plastic cleaner for plastic parts.

Before cleaning, make sure to tape the air inlet for the air-conditioner and heater system at the swivel frame.

Servicing

Adhere to the instructions for regular servicing to keep the machine in good condition.

Coolant - refill



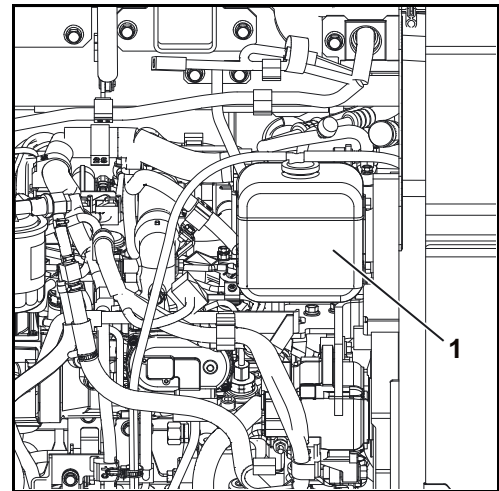
Do not mix coolant from different brands!

- Open the engine compartment cover (page 154).
- Check the antifreeze content with an antifreeze tester that is qualified for -25 °C.



The antifreeze portion of the coolant should not exceed 50 %.

- Open the coolant expansion reservoir cap when the engine is cool and fill pre-mixed coolant up to the FULL mark (1).
- Close the expansion tank cover.
- Close the engine compartment cover.

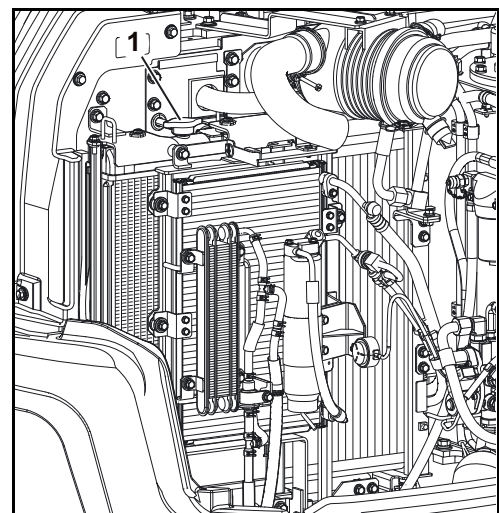


If the coolant expansion reservoir was completely empty, check the coolant level in the radiator.



Do not open the radiator cap while the engine is still hot, risk of scalding.

- Open the side cover (page 155).
- Remove the radiator cap (1) by turning it anticlockwise.
- The coolant level should be at the lower mark of the filler plug; if not, add coolant.
- Close the radiator cap.
- Close the side cover.

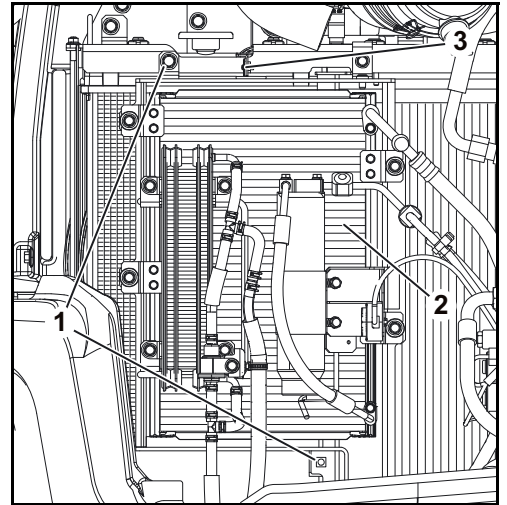


Radiator and condenser - clean



Do not touch the hot radiators: risk of burning.

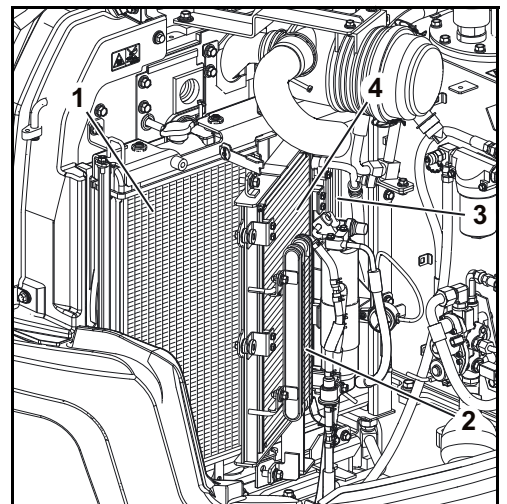
- Open the side cover (page 155).
- Remove the screws (1).
- Open the condenser (2) forwards.
- Drop down the stopper (3) and lock the condenser.



- Clean the coolant radiator (1), hydraulic oil radiator (3), fuel cooler (2) and condenser (4) from the engine side with a water jet or a compressed air pistol. Do not use high-pressure cleaners.
- Pay particular attention to the space between the radiators and the condenser, as leaves tend to accumulate here.

Check the radiator and condenser for damage after cleaning it.

- Raise the stopper (3) and unlock the condenser.
- Close the condenser (2) backwards.
- Tighten the screws (1).
- Close the side cover.

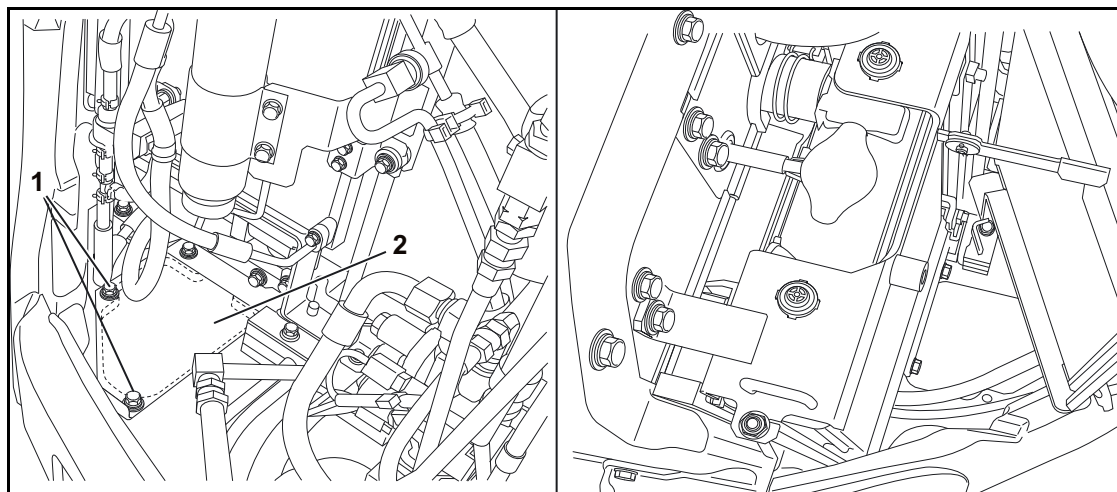


Dusting cover

In cleaning the cooler, remove the dusting cover to discharge dust out of the machine.

Remove the screws (1).

Remove the dusting cover (2).



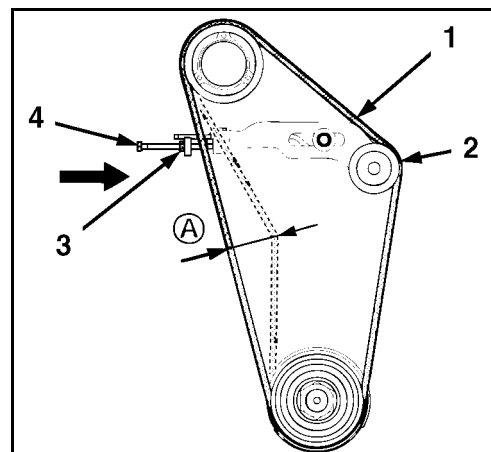
V-belts - check/adjust/change

Adjusting the V-belts

- Open the engine compartment cover (page 154).
- Check the V-belt (page 85).

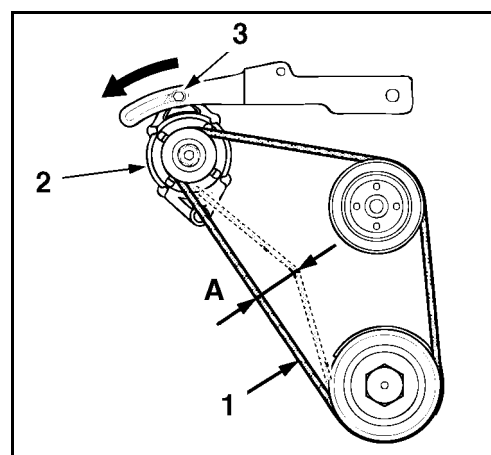
Air conditioner V-belt (optional)

- Loosen the lock nut (3).
- Rotating the screw (4) clockwise adjusts the tension roller (2) and tensions the V-belt (1).
- Press in the V-belt at position "A". The V-belt must give way by approx. 12-15 mm (pressure: 6-7 kg).
- Tighten the lock nut (3).
- After adjusting, check the V-belt.



Fan/Alternator V-belt

- Loosen the fastening screw (3).
- Tighten the V-belt (1) by swinging the alternator (2).
- Press in the V-belt at position "A". The V-belt must give way by approx. 7-9 mm (pressure: 6-7 kg).
- Tighten the fastening screw.
- After adjusting, check the V-belt.
- Close the engine compartment cover.



Coolant hoses and hose clamps - check

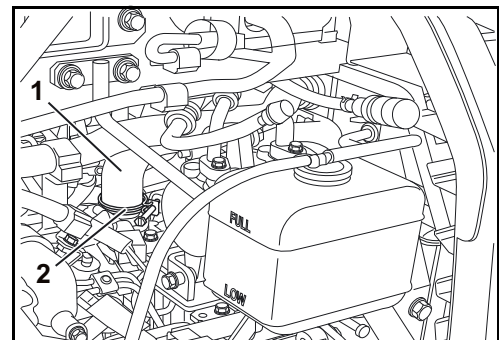
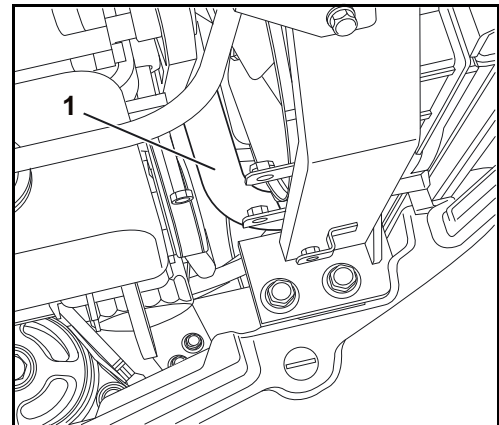
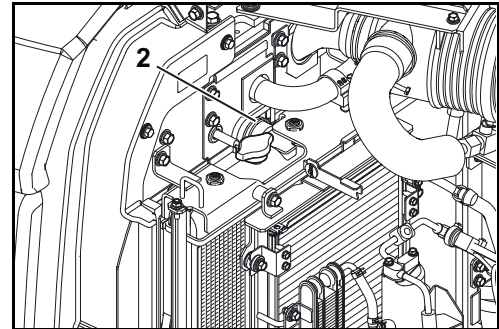


Carry out the inspection while the engine is cold.

- Open the engine compartment cover (page 154).
- Open the side cover (page 155).

Inspect condition (cracks, bulges, hard spots) of all coolant hoses (1) on the engine and to the radiator or to the heater fan, and ensure that they are tight and the clamps (2) are securely fastened. If necessary, have the hoses replaced by trained personnel.

- Close the side cover.
- Close the engine compartment cover.



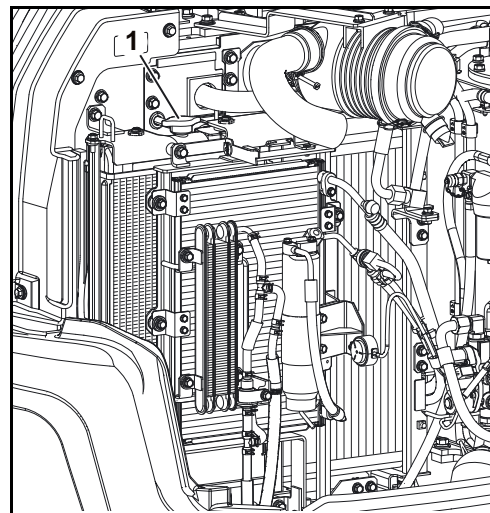
Coolant - change



Drain the coolant only when the engine is cold.

Total cooling system capacity: 7 l

- Open the engine compartment and side cover (page 154).
- Remove the radiator cap (1) by turning it anticlockwise.

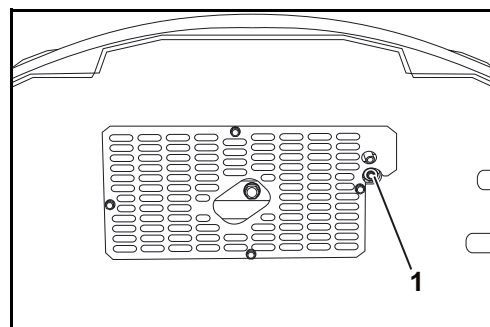


- Open the central coolant drain plug (1) and drain the coolant completely.



Fill the coolant in a container and dispose of it in accordance with the prevailing environmental protection regulations.

Purge the cooling system if the coolant is very dirty. To do this, spray water without additives into the cooling system with a hose through the filler opening until clear water emerges at the outlet.

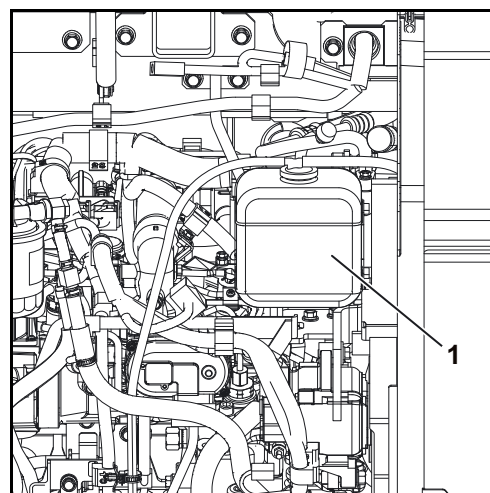


- Close the central drain.
- Remove the coolant expansion reservoir (1) and drain it, cleaning it if necessary. Refit the reservoir.
- Fill the premixed coolant into the radiator and expansion reservoir.



Do not operate the cooling system with pure water (even in summer). The antifreeze also contains a corrosion inhibitor.

- Start the engine (page 96) and let it run at idle speed to warm up.
- Stop the engine (page 99).
- Check the coolant level (page 84), adding coolant if necessary (page 182).
- Close the engine compartment and side cover.



Engine oil and oil filter - change

- Open the engine compartment cover (page 154).



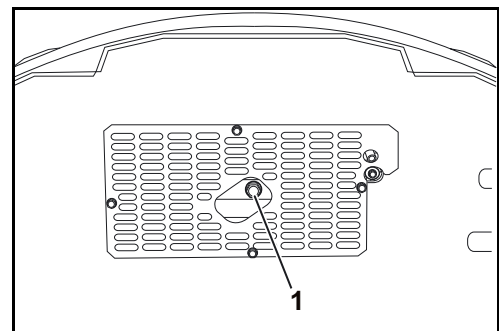
Caution: The engine oil and the oil filter are very hot → risk of scalding.



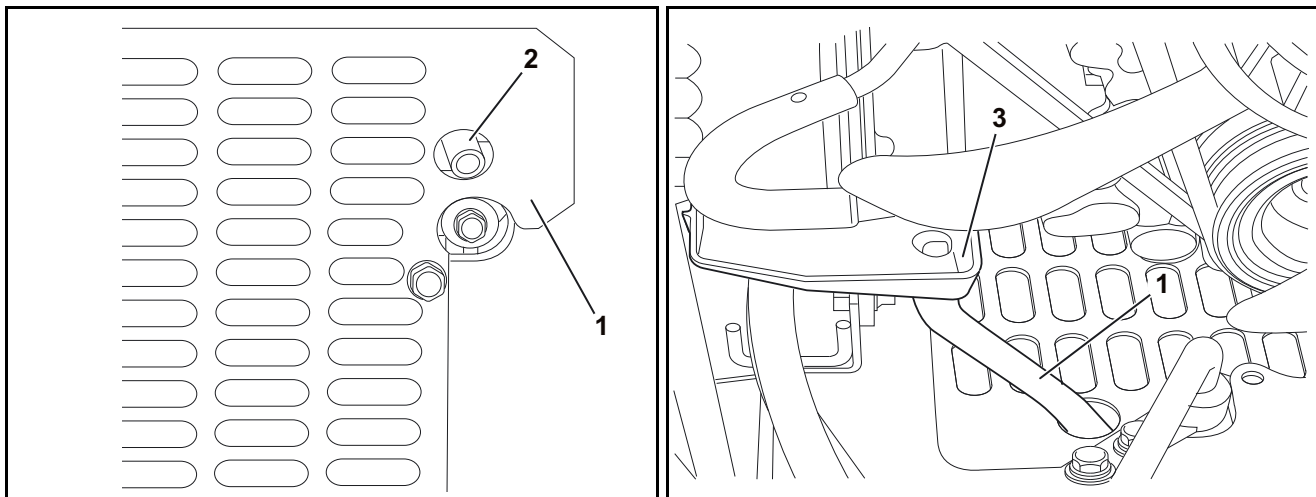
Place an oil pan with a capacity of about 15 l under the engine oil drain. The engine oil should not be allowed to seep into the soil and it must be discarded like the oil filter in accordance with the applicable environment protection regulations.

Engine oil - drain

- Remove the oil drain plug (1) and let the engine oil drain into the drain pan.
- Install the oil drain plug using a new seal.

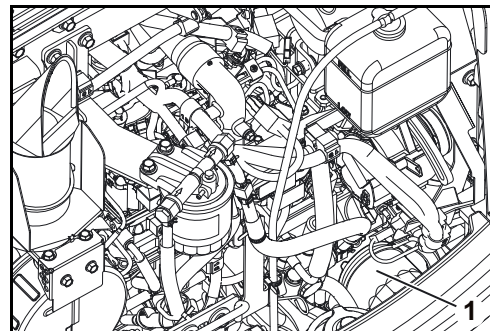


Suppose that the cover (1) has been removed from below the engine for maintenance purpose. Before attaching it back into position, pass the drain hose (2) of engine oil tray (3) through the cover's hole.



Oil filter - change

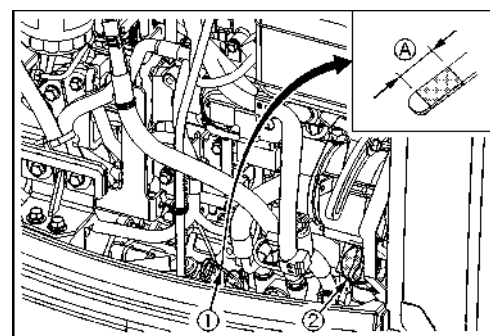
- Place an oil pan under the oil filter (1). Remove the oil filter using a filter wrench (turn anticlockwise).
- Coat the sealing ring of the new oil filter with engine oil.
- Install and tighten the oil filter by hand. Do not use the filter wrench.



Engine oil - fill

Filling capacity: 7 l

- Remove the oil filler cap (2) and fill engine oil. See the "Operating materials" section (page 180).
- Screw in the oil filler cap.
- Start the engine (page 96). The engine oil pressure indicator must go out as soon as the engine has started. If this does not happen, switch the engine off immediately and contact trained personnel.
- Let the engine run at idle speed to warm up, then stop it (page 99). Check the oil level after 5 minutes.
- Pull out the oil dipstick (1) and wipe it with a clean cloth.
- Insert the oil dipstick completely and pull it out again. The oil level should be in the "A" area. If the oil level is too low, add engine oil.



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

- When changing the engine oil, fill engine oil up to the MAX mark.
- Close the engine compartment cover.

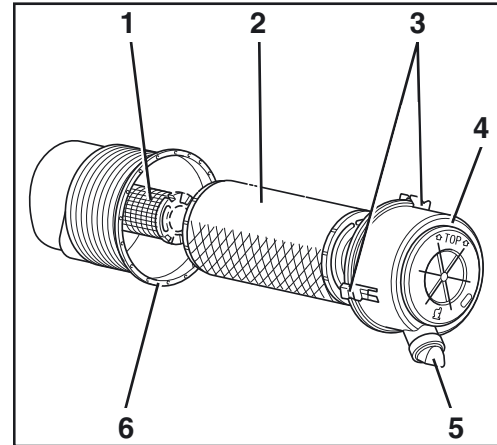
Air filter - check/clean/change



Risk of engine damage!

The interior filter element (1) must remain installed while cleaning the air filter case (6). Otherwise, particles of dirt could enter the air intake duct while cleaning and damage parts of the injection system and engine.

- Open the side cover (page 155).
- Open the clips (3) and remove the cover (4).
- Pull the outer filter element (2) out of the air filter case (6) and check it for dirt.
- Clean the air filter case and cover without removing the inner filter element (1). Remove the inner filter element only when replacing it.
- Clean the dust valve (5).
- Replace the outer filter element if it is damaged or too much dust has accumulated on it.



The internal filter element must only be replaced by skilled personnel in the framework of the corresponding service period.

- For the replacement, pull the internal filter element out and immediately insert a new filter element.

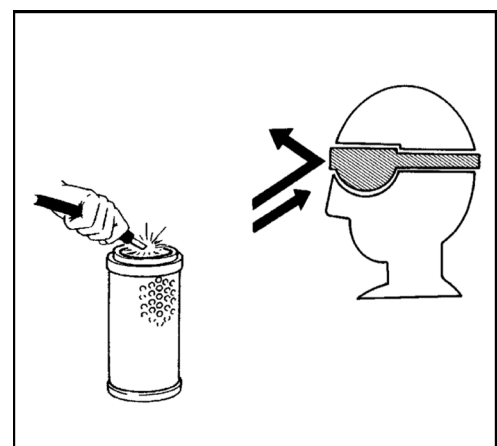


Do not clean the filter element with fluids. Never operate the engine without the air filter elements.



Always wear eye protection when working with compressed air.

- Clean the outer filter element with compressed air (max. 5 bar) from the inside out without damaging the filter element. Wear eye protection for this service.
- Insert the outer air filter element and the cover with the TOP mark facing up. Then lock the braces.
- Close the side cover.



Fuel filter - change



While changing the fuel filter, be careful not to allow dust or dirt into the fuel line and the fuel filter.



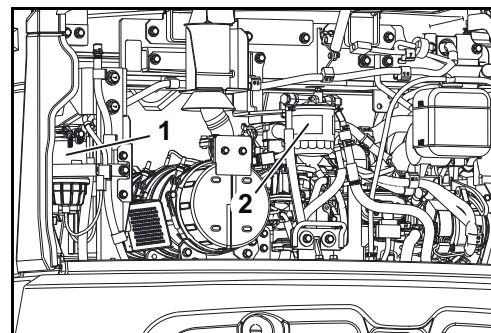
Always remove spilled fuel immediately.

- Open the engine compartment cover (page 154).



Place a cleaning cloth under the fuel filter to prevent fuel from spilling onto the ground.

- Turn the cock (1) at the water separator to the OFF position.
- Remove the fuel filter (2).
- Wet the rubber seal of the new filter with fuel.
- Install a new filter and tighten it by hand.
- Switch the shutoff-valve to the ON position.
- Bleed the fuel system (page 149).
- Check the fuel filter for leaks.



Dispose of cleaning cloths and the old filter in accordance with applicable environmental protection regulations.

- Close the engine compartment cover.

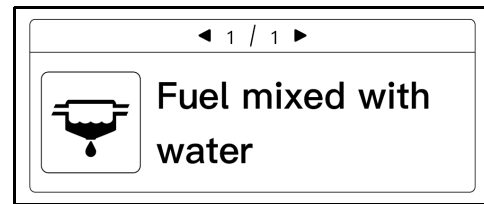


If the fuel filter is not replaced regularly, the cleaning interval for the diesel particle filter can no longer be guaranteed. The particle filter would be clogged earlier than expected.

Water separator - drain



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



Risk of engine damages from water in the fuel!

Water reduces the lubrication capacity of the diesel fuel. The injection pump could be damaged and metal parts could corrode. Furthermore, the diesel particle filter's cleaning interval can no longer be guaranteed. The particle filter would be clogged earlier than expected. If the "Water mixed with fuel" malfunction indicator appears on the display, the water must be drained from the water separator immediately after the engine has stopped.



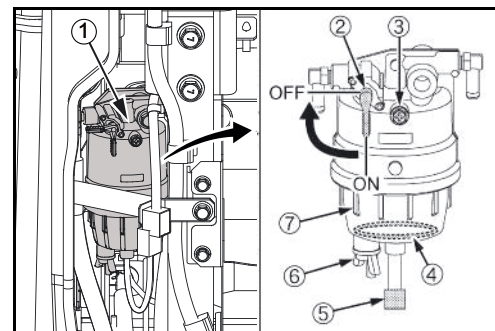
Always remove spilled fuel immediately.

- Open the engine compartment cover (page 154).
- Visual inspection of the water separator for water and sediments.



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the "OFF" position.
- Loosen the venting screw (3).
- Loosen the drain valve (6) and drain the impurities.
- Close the drain valve.
- Tighten the venting screw.
- Make sure that the sensor cable plug (5) is connected.
- Switch the shutoff-valve to the ON position.
- Bleed the fuel system (page 149).
- Check the water separator for leaks.



Dispose of cleaning cloths according to the applicable environmental protection regulations.

- Close the engine compartment cover.

Water separator - clean



While changing the fuel filter, be careful not to allow dust or dirt into the fuel line and the fuel filter.



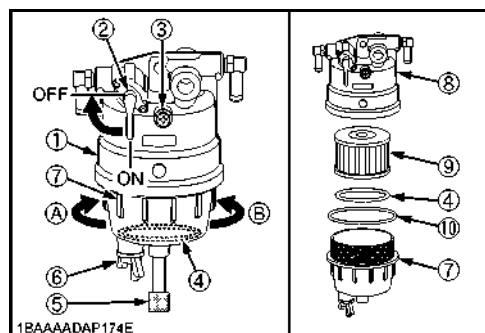
Always remove spilled fuel immediately.

- Open the engine compartment cover (page 154).



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the "OFF" position.
- Disconnect sensor cable plug (5).
- Remove (A) the filter cup (7).
- Empty the filter cup and clean it with clean diesel fuel.
- Check the sealing ring (10) and replace if damaged.
- Screw on (B) the filter cup and tighten it by hand.
- Switch the shutoff-valve to the ON position.
- Bleed the fuel system (page 149).
- Check the water separator for leaks.
- Connect sensor cable plug.



Dispose of cleaning cloths according to the applicable environmental protection regulations.

- Close the engine compartment cover.

Water separator filter - change



While changing the fuel filter, be careful not to allow dust or dirt into the fuel line and the fuel filter.



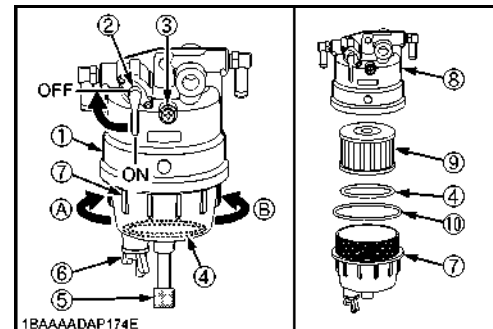
Always remove spilled fuel immediately.

- Open the engine compartment cover (page 154).



Place a cleaning cloth under the water separator (1) to prevent fuel from running onto the ground.

- Turn the cock (2) to the "OFF" position.
- Disconnect sensor cable plug (5).
- Remove (A) the filter cup (7).
- Remove the filter element (9) from the filter head (8).
- Empty the filter cup and clean it with clean diesel fuel.
- Insert a new filter element.
- Check the sealing ring (10) and replace if damaged.
- Screw on (B) the filter cup and tighten it by hand.
- Switch the shutoff-valve to the ON position.
- Bleed the fuel system (page 149).
- Check the water separator for leaks.
- Connect sensor cable plug.



Dispose of cleaning cloths according to the applicable environmental protection regulations.

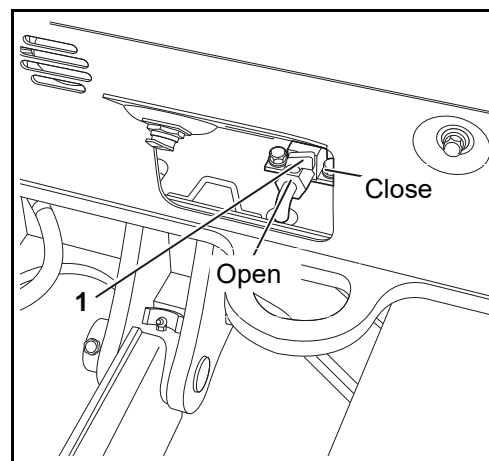
- Close the engine compartment cover.

Fuel tank - drain

- Open the front service cover (page 156).
- Place a container with a minimum capacity of 12 l under the fuel drain valve.
- Open drain valve (1) and drain the water.
- Close the drain valve.

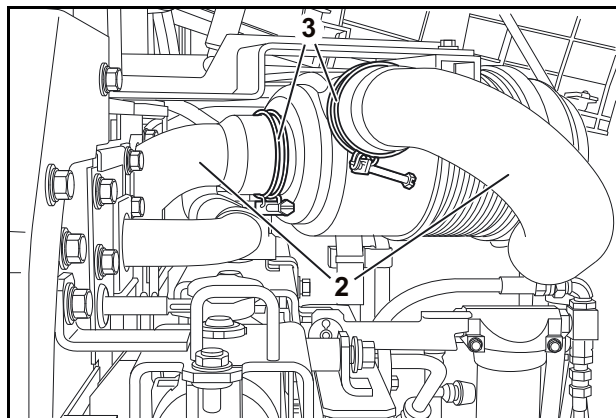
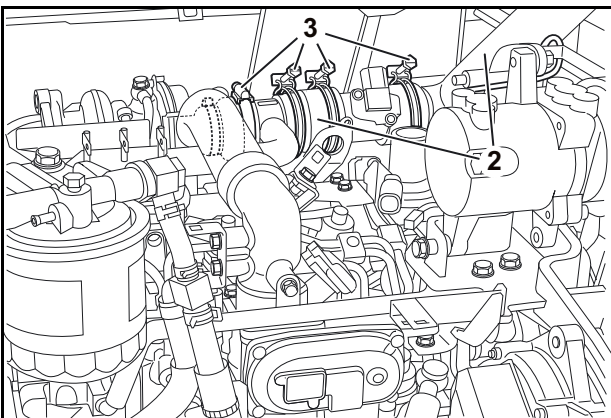
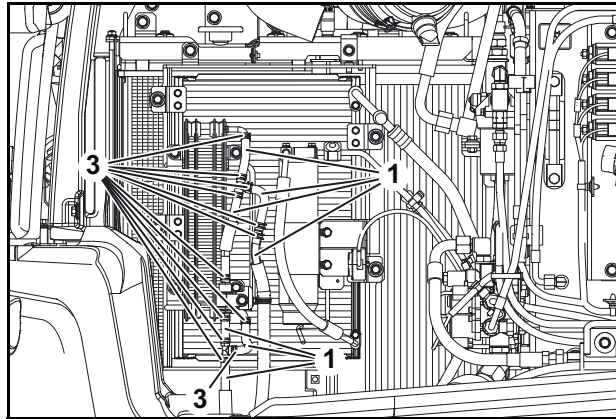
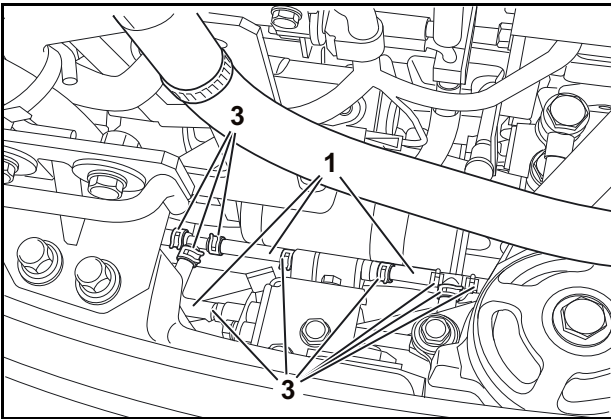
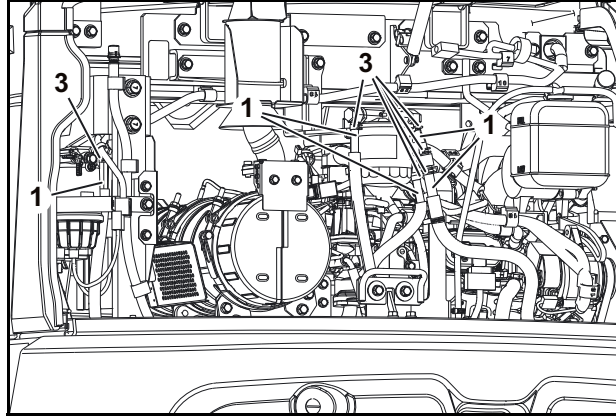
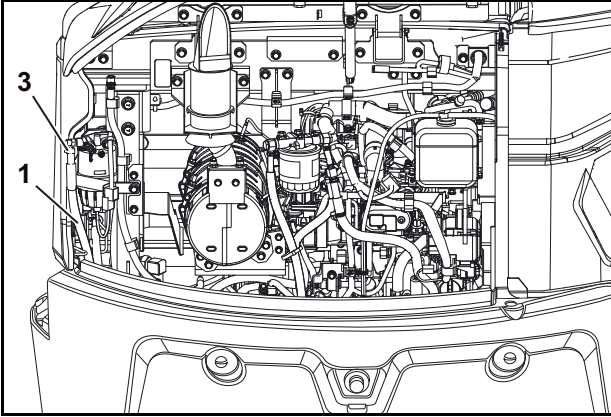


Dispose of fluid in the container according to the applicable environmental protection regulations.



Fuel lines and the air intake hoses - check

- Check all accessible fuel lines (1), air intake hoses (2) and clamps (3) to ensure that they are not damaged and are firmly seated.
- Repair or replace damaged parts.



Return filter in the hydraulic oil tank - change



While replacing the return filter, be careful not to allow dust or dirt into the hydraulic oil tank.



Always remove spilled hydraulic oil immediately.

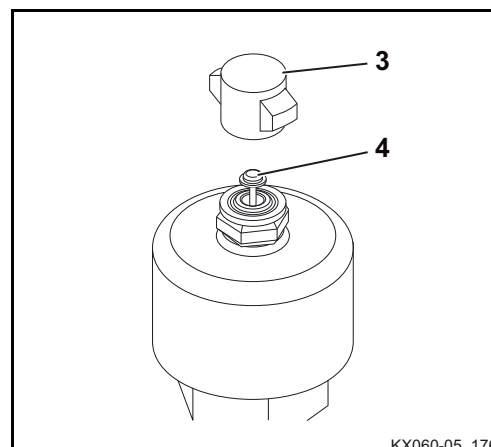


Pay attention to utmost cleanliness when servicing the hydraulic system.

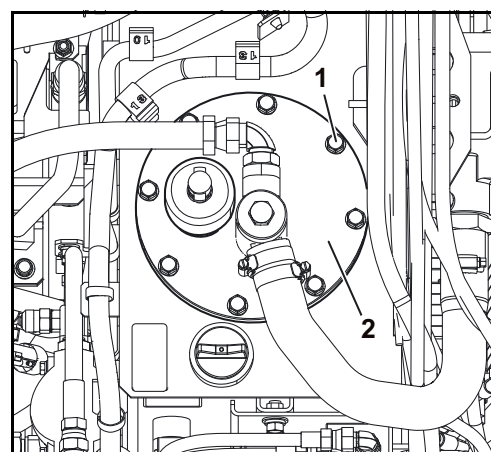


Risk of injury by hot and pressurized hydraulic oil! This service may only be carried out after the hydraulic oil has cooled down. Then release pressure.

- Open the side cover (page 155).
- Unscrew the cap nut (3).
- Push the button (4) to release pressure.
- Reinstall the cap nut.



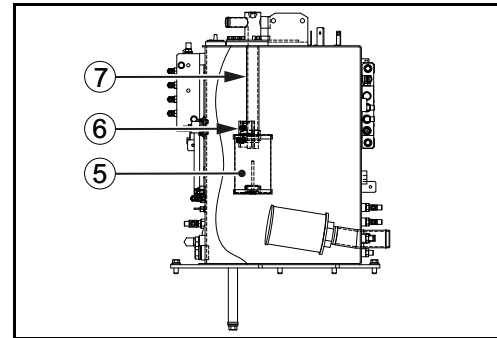
- Remove the screws (1).
- Remove the hydraulic oil tank cover (2).



- Remove the return filter (5) with rod (7).
- Loosen the screw (6).
- Remove the return filter and replace it with a new one.



Dispose of cleaning cloths and the old filter element in accordance with applicable environmental protection regulations.



- Tighten the screw (6).
- Check the condition of the sealing ring of the hydraulic oil tank cover. Replace if necessary.
- Insert the return filter with rod.
- Screw on the hydraulic oil tank cover.
- Close the side cover.

Tank breather filter - change



Pay attention to utmost cleanliness when servicing the hydraulic system.

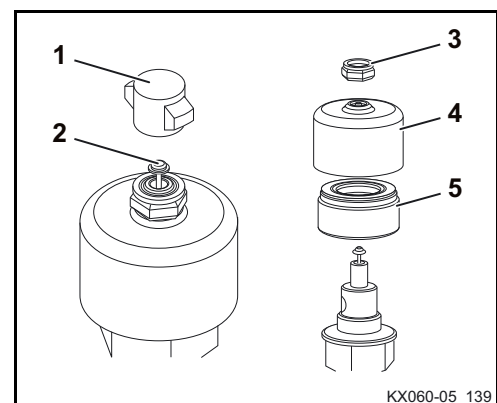


Risk of injury by hot pressurized hydraulic oil! This service may only be carried out after the hydraulic oil has cooled down. Then release pressure.

- Open the side cover (page 155).
- Unscrew the cap nut (1).
- Push the button (2) to release pressure.
- Unscrew the nut (3) and remove the cover (4).
- Take the breather filter (5) out of the hydraulic tank cover and replace it with a new one.



Dispose of cleaning cloths and the old filter element in accordance with applicable environmental protection regulations.



- Tighten the cover (4) and the nut (3) and install the cap nut (1).
- Close the side cover.

Pilot circuit filter - change



While changing the pilot circuit filter, be careful not to allow dust or dirt into the pilot circuit filter.



Always remove spilled hydraulic oil immediately.

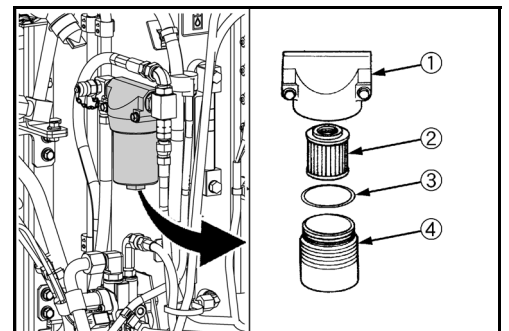


This service may only be carried out after the hydraulic oil has cooled down.

- Open the side cover (page 155).
- Remove the filter cup (4) from the filter head (1).
- Remove the filter element (2) from the filter head.
- Install a new filter along with the included new sealing ring (4).



Dispose of cleaning cloths and the old filter element in accordance with applicable environmental protection regulations.



- Screw in the filter cup and tighten it by hand.
- Start the engine (page 96). Let the engine run at idle speed to warm up, then stop it (page 99).
- Check the hydraulic oil level, add oil if necessary.
- Close the side cover.

Suction filter - change



While replacing the hydraulic oil and the suction filter, be careful not to allow dust or dirt into the hydraulic oil tank.



Always remove spilled hydraulic oil immediately.



Pay attention to utmost cleanliness when servicing the hydraulic system.

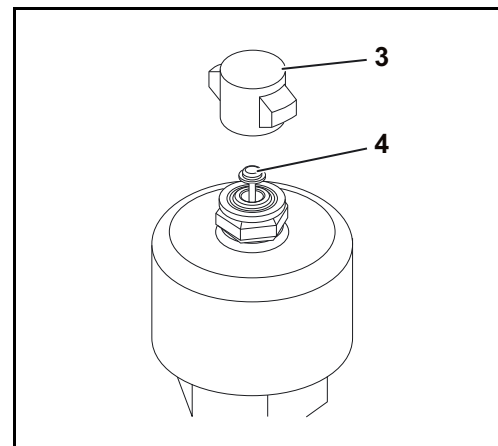


Risk of injury by hot pressurized hydraulic oil! This service may only be carried out after the hydraulic oil has cooled down. Then release pressure.

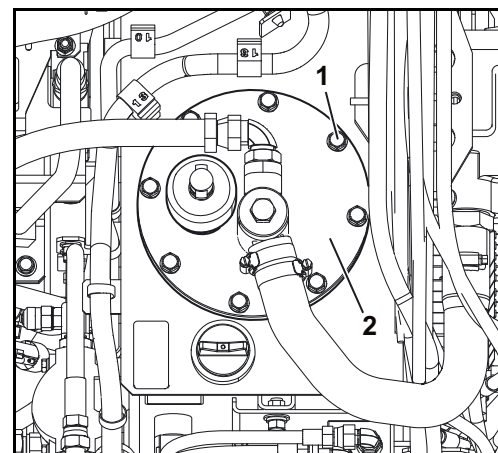


The suction filter must be replaced along with the hydraulic oil.

- Open the side cover (page 155).
- Unscrew the cap nut (3).
- Push the button (4) to release pressure.
- Reinstall the cap nut.
- Drain the hydraulic oil (page 203).
- Remove the return filter from the hydraulic oil tank (page 197).



- Remove the screws (1).
- Remove the hydraulic oil tank cover (2).



Maintenance

- Remove the suction filter assembly (5).
- If necessary, remove any residues with a clean, lint-free cloth.

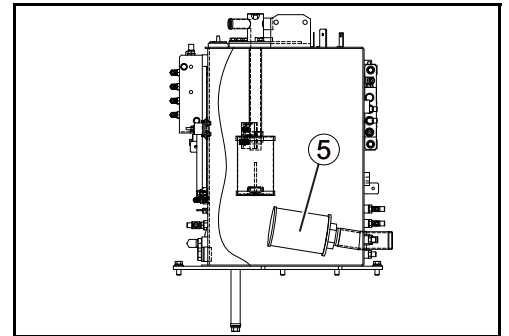


Discard the suction filter and cleaning cloth in accordance with applicable environmental protection regulations.

- Install the new suction filter assembly.
- Install the return filter (page 197).
- Check the condition of the sealing ring of the hydraulic oil tank cover.

Replace if necessary.

- Attach hydraulic oil tank cover and screw on tightly.
- Fill hydraulic oil (page 203).
- Close the side cover.



Hydraulic oil - refill/change



While replacing the hydraulic oil and the suction filter, be careful not to allow dust or dirt into the hydraulic oil tank.



Always remove spilled hydraulic oil immediately.



Pay attention to utmost cleanliness when servicing the hydraulic system.

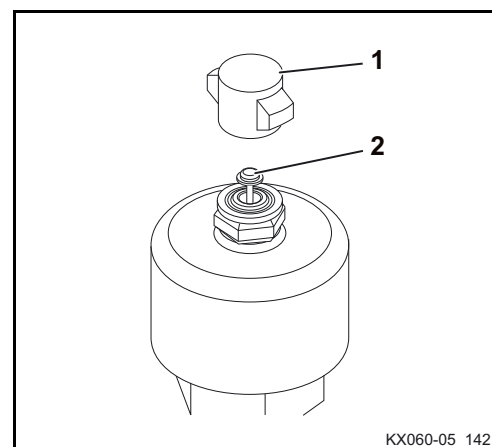


Risk of injury by hot pressurized hydraulic oil! This service may only be carried out after the hydraulic oil has cooled down. Then release pressure.



The suction filter must be replaced along with the hydraulic oil.

- Operate the boom, arm, bucket and boom swing mechanism so that all hydraulic cylinders are extended half way. Lower the dozer onto the ground. See the "Placing out of operation" section (page 133).
- Open the side cover (page 155).
- Unscrew the cap nut (1).
- Push the button (2) to release pressure.
- Reinstall the cap nut.

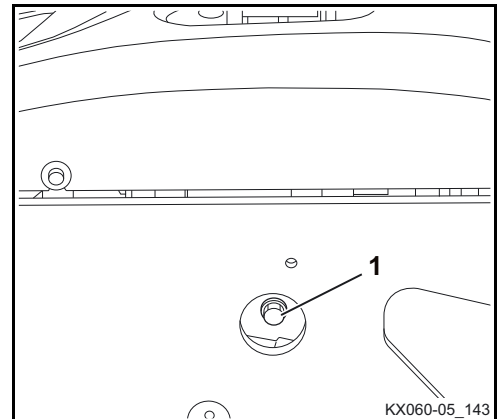


Draining the hydraulic oil



The swivel frame must be turned 90° to the right for the hydraulic oil drain to be accessed.

- Place a container with a minimum capacity of 100 l under the hydraulic oil drain plug.
- Remove the drain plug (1) and drain the hydraulic oil.
- Install the drain plug with a new sealing ring.



Filling the hydraulic oil

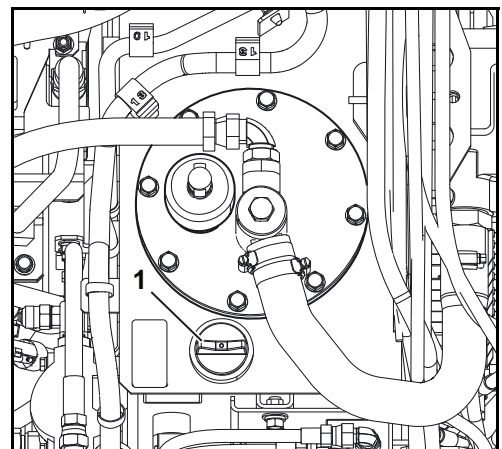


Before filling in a different brand of hydraulic oil, drain the hydraulic oil system completely.

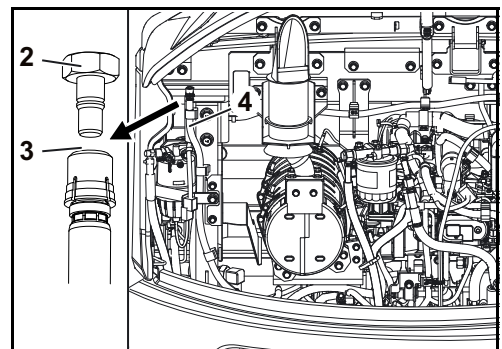
Filling quantity with oil change: approx. 40 l

Total hydraulic system capacity: 76 l

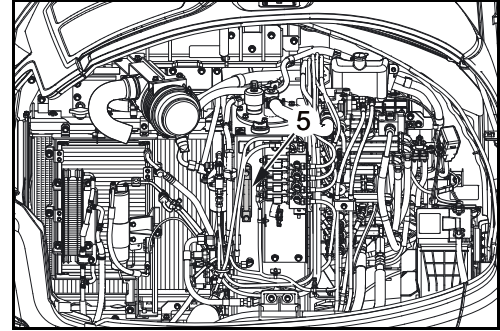
- Remove the filler plug (1) from the hydraulic oil tank.
- Insert a clean funnel with a strainer into the filler plug opening.
- Open the engine compartment cover (page 154).



- Press in the hexagonal plug (2) and the black plastic lock section (3) of the air bleed hose for the hydraulic pump (4) as well.
- Then hold the black plastic lock section and pull out the hexagonal plug.



- Fill hydraulic oil to half way up the sight glass (5).
- Refit the hexagonal plug to the hose.
- Close the engine compartment cover.
- Refit the plug to the hydraulic oil tank.
- Close the side cover.



Before starting the engine, make sure to fit the filler plug of hydraulic tank and the hexagonal plug of the air bleed hose for the hydraulic pump.

- Start the engine (page 96) and operate all control functions.
- Operate the boom, arm, bucket and boom swing mechanism so that all hydraulic cylinders are extended half way. Lower the dozer onto the ground. See the "Placing out of operation" section (page 133).
- Check the hydraulic oil level, add oil if necessary.

Battery service



The battery can become damaged or may explode if the following instructions are not observed. Regular maintenance can extend the life cycle of the battery considerably.

- For refillable-type batteries, never charge or use when the electrolyte level is below the [LOWER] (lower limit level) mark.
- Check the fluid level regularly and top up distilled water as required so that the electrolyte level is between the [UPPER] and [LOWER] levels.
- Check the battery regularly.



When servicing a battery, always wear suitable protective gloves and eye protection.

Battery - check

- Open the side cover (page 155).



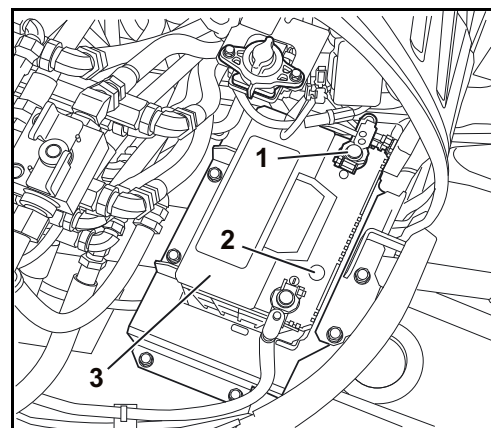
Be careful when cleaning the positive terminal (1) - risk of short circuit! Do not use metal tools.

- The battery charge must be checked on the charge indicator (2) according to the operating instructions of the battery manufacturer.



How to read the indicator

State of indicator display	
Green	Specific gravity of electrolyte and quality of electrolyte are both in good condition.
Black	Needs charging battery.
White	Needs replacing battery.



Do not open maintenance-free batteries!

- Check battery (3) for tight fit, if necessary screw tight.
- Check battery poles for cleanness, if necessary clean and grease with petroleum jelly.
- Close the side cover.

Battery - charge



Battery acid is very caustic. Avoid contact with battery acid under all circumstances. If clothing, skin or eyes have come in contact with battery acid, rinse the affected parts immediately with water. If the eyes are affected, immediately seek medical attention! Neutralise spilled battery acid immediately.



When servicing a battery, always wear suitable protective gloves and eye protection.



Charge batteries only in sufficiently ventilated rooms. Smoking, uncovered lights or fire are not allowed in these rooms.



Explosive gas is created when charging batteries. Open flames can cause an explosion.



For refillable-type batteries, remove the plugs when charging batteries that are virtually empty. If the batteries are merely being recharged, the plugs can be left in the batteries.



The battery can only be charged if the starter switch is in the STOP position and the key removed.

- Make the battery accessible.
- For refillable-type batteries, check the electrolyte level in the battery, add distilled water if required.



When disconnecting and connecting the battery, always observe the specified order → risk of short circuit.

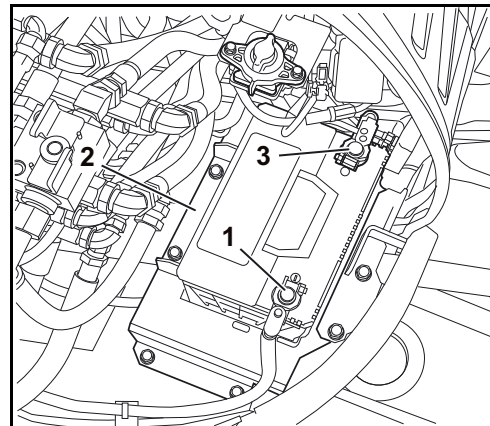
- Remove the negative terminal cover and take off the cable clamp. Move the clamp to the side so as to avoid contact with the negative terminal.
- Remove the positive terminal cover.
- Connect the battery charger to the battery according to the instructions of the charger manufacturer. Choose the normal (gentle) charging method.
- Clean the battery after charging. For refillable-type batteries, replenish the electrolyte, if necessary.
- For refillable-type batteries, check the acid density with a hydrometer. The acid density should be between 1.24 and 1.28 kg/l. If the acid density differs considerably among the individual cells of a battery, the battery probably has a defect. Check the affected battery with a battery tester and contact trained personnel.

Battery - change



When disconnecting and connecting the battery, always observe the specified order → Risk of short circuit.

- Open the side cover (page 155).
- Remove the negative terminal cover and take off the cable clamp (1). Move the clamp to the side so as to avoid contact with the negative terminal.
- Remove the positive terminal cover and take off the cable clamp (3). Move the clamp to the side so as to avoid contact with the positive terminal.
- Remove the battery retainer (2) and lift the battery out of the swivel frame.



When replacing the battery, always install a battery of the same type with the same power rating and the same dimensions.

- Before installation, cover the battery terminals and cable clamps with petroleum jelly.
- Install the battery in the swivel frame and fasten it with the battery retainer. Make sure that the battery is installed tightly → Do not operate the machine with a loose battery.
- Connect the positive cable clamp to the positive terminal (+) of the battery, install the positive terminal cover.
- Connect the negative terminal (-) of the battery, install the negative terminal cover.



Pre-installed battery

Type	Hold-down	Voltage (V)	Capacity (Ah)	Reserve Capacity (Min.)	Cold Cranking Amps (A)	Normal Charging Rate (A)
90D26 L(JIS)	B7	12	52 (5 h)	125	680	6.5

Lubrication

The following describes all lubricating tasks which should be performed with the superstructure.

Swivel gear - grease

- Fill grease through the grease fitting (1) with a grease gun.



Grease at each 90° position of the swivel gear. Fill a total of approx. 50 g of grease (approx. 20 shots with the grease gun). Refer to the "Operating materials" section (page 180).

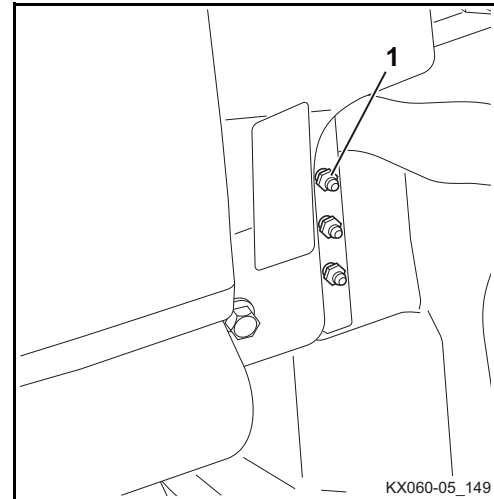


When moving the swivel frame, make sure no person or material is in the swivel area. Turn the starter switch to the STOP position and remove the key before the next greasing procedure.

- Operate the machine and swivel the swivel frame by 90° several times. After greasing, swivel the swivel frame 360° several times to distribute the grease evenly.



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



Swivel ball bearing - grease

- Fill grease through the grease fitting (1) with a grease gun.



Grease at each 90° position of the pitch bearing. Using the grease gun, apply 5 shots at every position. Refer to the "Operating materials" section (page 180).

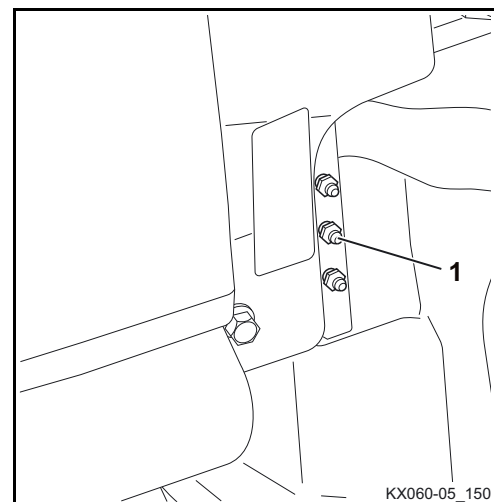


When moving the swivel frame, make sure no person or material is in the swivel area. Turn the starter switch to the STOP position and remove the key before the next greasing procedure.

- Operate the machine and swivel the swivel frame by 90° several times. After greasing, swivel the swivel frame 360° several times to distribute the grease evenly.



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

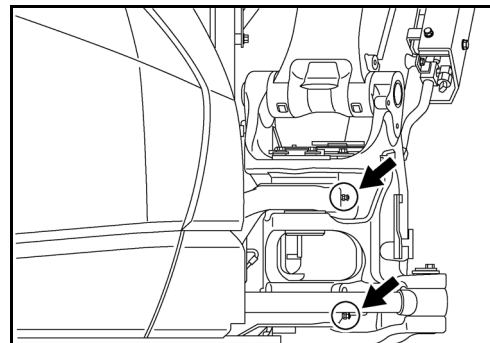


Swing bracket - grease

- Lubricate both greasing points (see figure to the right) – see the "Operating materials" section (page 180) – by injecting grease until fresh grease emerges.

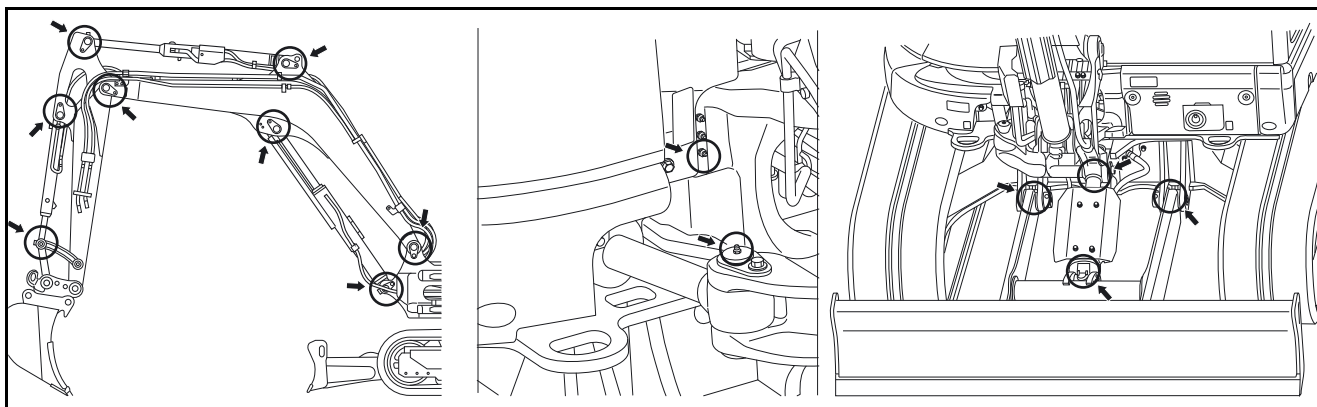


Wipe emerged grease off immediately and store dirty cleaning cloths in the containers provided for disposal.



Other greasing points

- Start the engine (page 96).
- Position the boom, arm, and dozer as shown in the figure. Stop the engine, remove the key. Refer to the "Operating the controls during excavation work" section) (page 117).



- Lubricate all greasing points with grease – see the "Operating materials" section (page 180) – until fresh grease emerges.



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

Crawler tension - check/adjust



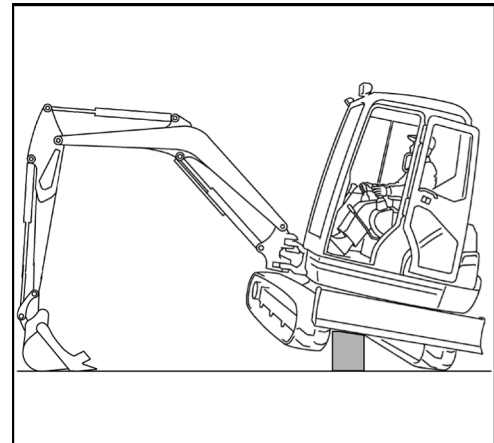
If the crawlers are too tight, wear is increased.



If the crawlers are too loose, wear is increased and the crawlers may come off.

When parking an machine with rubber crawlers, ensure that the seam (∞) is on top half way between the two sliders (see figure/1, "Crawler tension - check", page 210).

- Clean all parts of the running gear, paying particular attention to stones between the crawler and sprocket or idler. Clean the area of the crawler tensioning cylinder.
- Swivel the swivel frame 90° to the direction of travel as shown in the figure.
- Lower the front attachments on the ground and raise the machine about 200 mm off the ground on one side.



Have a guide supervise the procedure.



Do not work under the machine, when lifting the machine itself with the attachment.



Support the machine with a safety block or safety post and keep the lock lever for attachment control in the "LOCK" position.

Crawler tension - check

- The crawler seam (3) is on the top halfway between the idler (1) and sprocket (2).

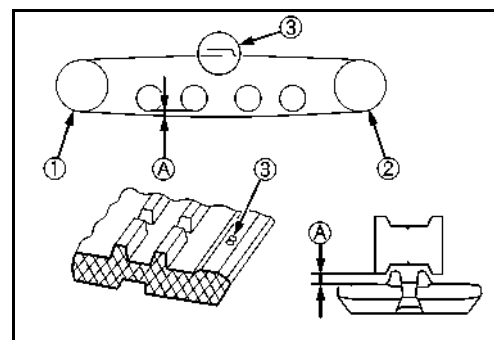


Crawlers with an SP mark can be checked and tensioned in any position.

- Check the crawler sag as shown in the figure.

Crawler sag "A" 10-15 mm

- If the crawler sag is more than 15 mm, adjust the crawler.
- If necessary, tighten or loosen the crawler.
- Start the engine and rotate the lifted crawler briefly.





Caution: The area around the rotating crawler must be free of persons. Turn the starter switch to the STOP position after rotating the crawler and remove the key.

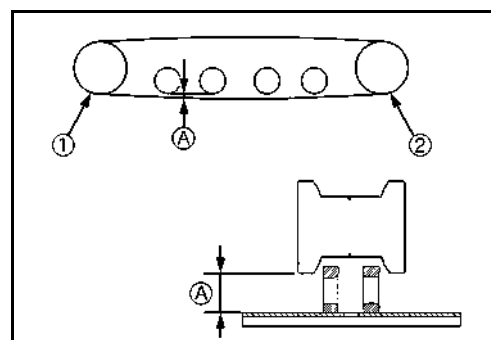
- Recheck the crawler tension, readjusting it if necessary.
- Perform the procedures on the second crawler.

Crawler tension (steel) - check

- Check the crawler sag as shown in the figure.

Crawler sag "A" 80-85 mm

- If the crawler sag is more than 85 mm, adjust the crawler.
- If necessary, tighten or loosen the crawler.
- Start the machine and rotate the lifted crawler briefly.



Caution: The area around the rotating crawler must be free of persons. Turn the starter switch to the STOP position after rotating the crawler and remove the key.

- Recheck the crawler tension, readjusting it if necessary.
- Perform the procedures on the second crawler.

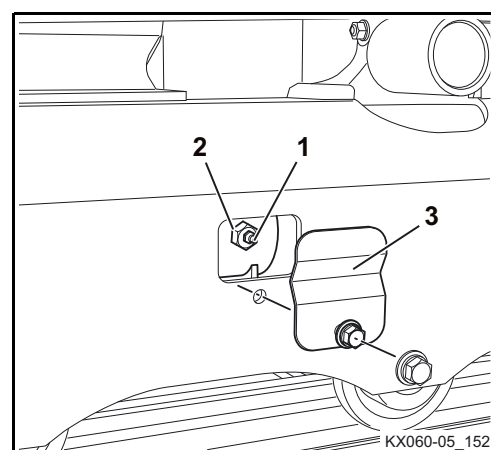
Crawler tension - adjust

Tightening the crawlers

- Remove the crawler tensioner cover (3).
- Position the grease gun on the grease fitting (1).
- Pump the grease gun until the specified crawler tension is obtained.

Loosening the crawlers

- Cautiously unscrew the pressure valve (2) and loosen the crawler.



Caution: Grease could squirt out from the cylinder opening.

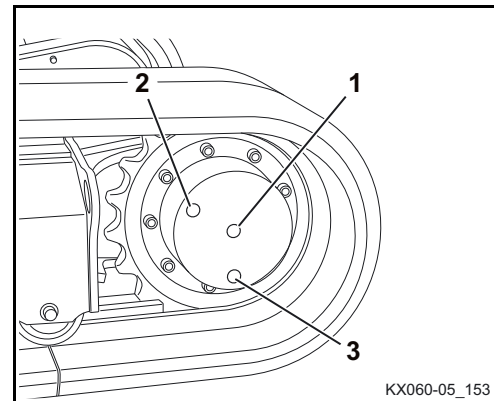
- Screw in the pressure valve and torque to 98-108 Nm.
- Tighten the crawler.

Drive unit oil - change



Only change the oil when the drive unit is warm to the hand; if not, drive the machine warm.

- Park the machine on level ground so that the drain plug (figure below, position 3) is positioned at the bottom.
- Place a catch tray with a minimum capacity of 2 l under the drain plug.
- Remove the drain plug and let the oil drain completely. Install the drain plug with a new sealing ring on it.
- Remove the oil filler plug (2) and oil level screw (1).
- Fill oil as specified in the "Operating materials" section (page 180). The oil level is the lower edge of the thread.



Capacities: 0.9 l

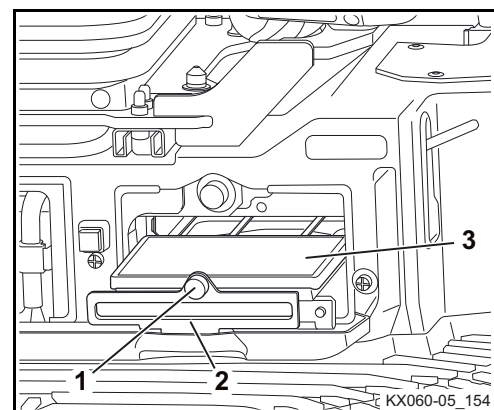
- Refit the oil filler plug and the set screw with a new sealing ring and tighten it.
- Perform the same service on the second drive unit.

Interior air filter - check/clean/change



If the machine is operated in a particularly dusty environment, the interior air filter must be checked more often.

- Open the heating and air-conditioner unit service cover (page 157).
- Remove the screw (1).
- Open the cover plate (2).
- Remove the interior air filter (3).



Checking

- Inspect the interior air filter for contamination and damage. In case of heavy contamination, replace the interior air filter.

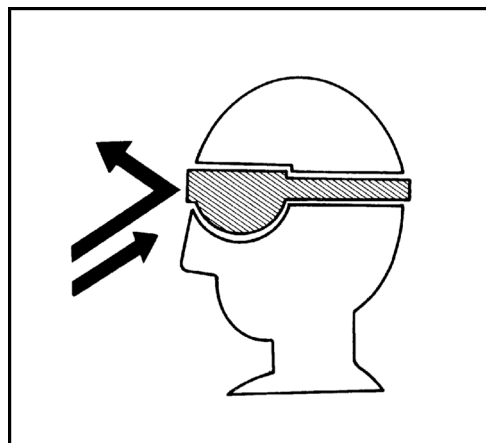
Cleaning



Clean only with filtered air at max. 2 bar pressure.



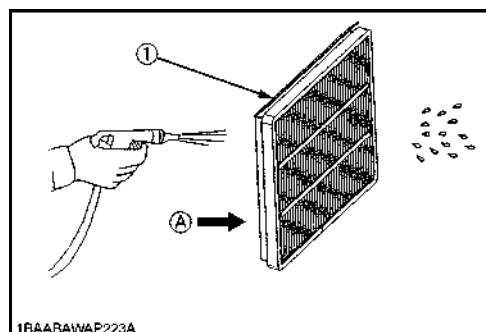
Always wear eye protection when working with compressed air.



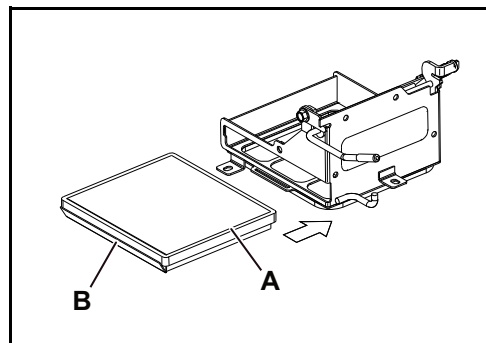
- Clean the filter (1) with compressed air in direction "A", opposite the normal direction of flow.



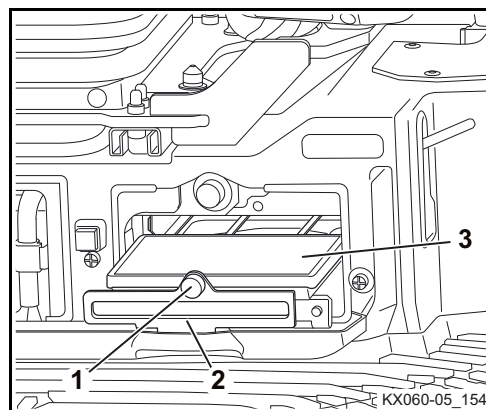
Take care not to damage the filter when installing it. A damaged filter would allow contaminated air to enter the air-conditioner assembly, causing severe damage.



Set the filter with the cushion (A) facing upward and with the V-flap (A) facing outwards. Wrong setting shortens the filter's service life.



- Replace the interior air filter (3).
- Close the cover (2).
- Tighten the screw (1).
- Close the heating and air-conditioner unit service cover.



Pipes and hoses of the heating and air-conditioner systems - check



Carry out the inspection while the engine is cold.

- Open the engine compartment cover (page 154).
- Open the side cover (page 155).
- Check that all the pipes and hoses of the heating and air-conditioner systems are in serviceable condition (no cracks, bulges or hard spots) and are firmly seated. If there are any worn or damaged parts found, consult your KUBOTA dealer. Only trained personnel may work on the heating and air-conditioner systems.
- Close the engine compartment and side cover.

Coolant content (air-conditioner only) - check



Avoid eye and skin contact. The refrigerant causes severe frostbite.



When working with refrigerants, always wear an eye protection.



Avoid contact of refrigerant and open flames. Burning the refrigerant produces a toxic gas.



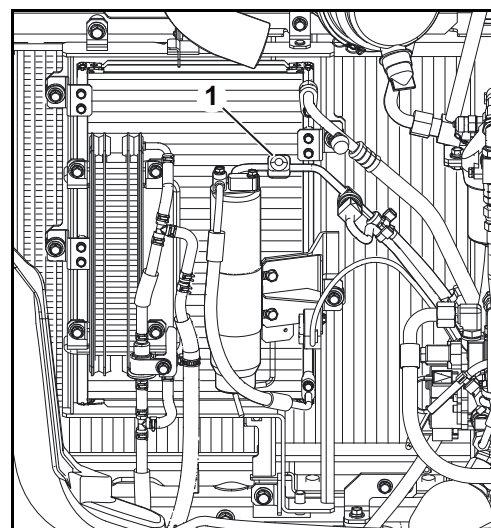
Do not detach or deactivate any components of the air-conditioner. Please contact your KUBOTA dealer.



This air conditioner contains fluorinated greenhouse gases (F-gases) (page 134).

A low refrigerant level affects the performance of the equipment and the air-conditioner will eventually automatically switch off. If you find out that the refrigerant level is too low, please contact your KUBOTA dealer.

- Open the side cover (page 155).
- Start the engine (page 96) and set an idle speed of 1500 1/min, if necessary.
- Set the temperature control to the "Cold" position and the fan to level 3, then switch on the air-conditioner.
- Using the sight glass (1), determine the refrigerant level according to the table below. If the refrigerant level is too low, please contact your KUBOTA dealer.



	Refrigerant level is OK	Small or no bubbles in the refrigerant
	Refrigerant level too low	Many large bubbles and foam in the refrigerant
	No refrigerant inside	Colourless and transparent

- Close the side cover.

Viewing the operations log

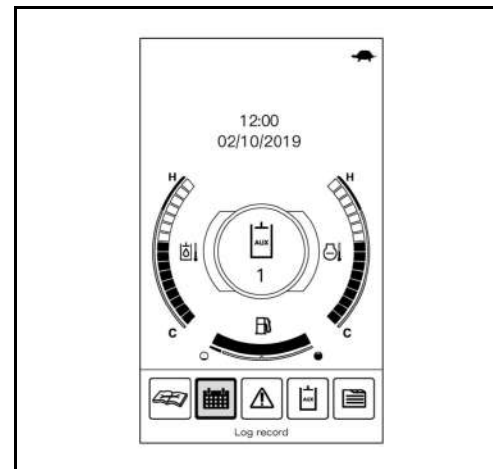
The operations log enables the operation of the machine over the previous three months to be checked.

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

The menu bar appears in the display.

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

The Log record appears in the display.

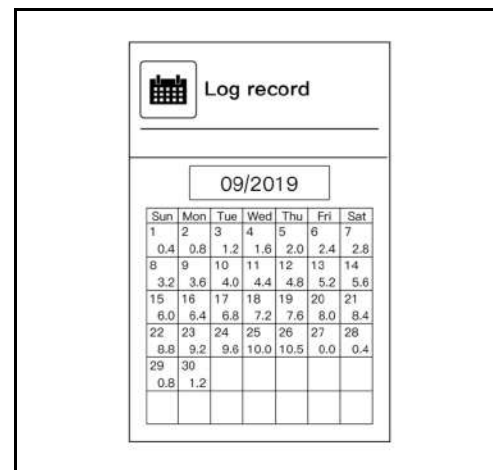


A calendar appears in the display.

- Press Jog dial (enter switch).
- Rotate jog dial to the right or the left until desired month is selected.
- Press Jog dial (enter switch).
- Log record of desired month appears in the display.



Certain days may be marked with (-) if the clock was reset or the battery disconnected. Operation of the machine on these days cannot be traced.



Bolted joints - check

The table below contains the torques for nuts and bolts. These may only be tightened with a torque wrench. Missing values can be requested from KUBOTA.

Tightening torque for screws

Nm (kgf•m)

	4 T (4.6)	7 T (8.8)	9 T (9.8-10.9)
M 6	7.8~9.3 (0.8~0.95)	9.8~11.3 (1.0~1.15)	12.3~14.2 (1.25~1.45)
M 8	17.7~20.6 (1.8~2.1)	23.5~27.5 (2.4~2.8)	29.4~34.3 (3.0~3.5)
M 10	39.2~45.1 (4.0~4.6)	48.1~55.9 (4.9~5.7)	60.8~70.6 (6.2~7.2)
M 12	62.8~72.6 (6.4~7.4)	77.5~90.2 (7.9~9.2)	103.0~117.7 (10.5~12.0)
M 14	107.9~125.5 (11.0~12.8)	123.6~147.1 (12.6~15.0)	166.7~196.1 (17.0~20.0)
M 16	166.7~191.2 (17.0~19.5)	196.1~225.6 (20.0~23.0)	259.9~304.0 (26.5~31.0)
M 20	333.4~392.3 (34.0~40.0)	367.7~431.5 (37.5~44.0)	519.8~568.8 (53.0~58.0)

Tightening torque for hose clamps

Diameter	Part name	Tightening torque
Ø 10~14	Clamp (screw version 14)	2.5~3.4 Nm
Ø 12~16	Clamp (screw version)	2.5~3.4 Nm
Ø 13~20	Clamps (13-20)	2.5~3.4 Nm
Ø 19~25	Clamp (screw version)	2.5~3.4 Nm
Ø 31~40	Clamp (screw version)	2.5~3.4 Nm
Ø 36~46	Clamp (screw version)	2.5~3.4 Nm
Ø 15~25	Clamps (15-24)	4.9~5.9 Nm
Ø 26~38	Clamps (26-38)	4.9~5.9 Nm
Ø 32~44	Clamps (32-44)	4.9~5.9 Nm
Ø 40~55	Clamps (40-55)	4.9~5.9 Nm
Ø 44~53	Clamp (screw version)	4.9~5.9 Nm
Ø 49~60	Clamp (screw version 60)	4.9~5.9 Nm
Ø 50~60	Clamps (50-60)	4.9~5.9 Nm
Ø 58~75	Clamps (58-75)	4.9~5.9 Nm
Ø 66~88	Clamps (66-88)	4.9~5.9 Nm
Ø 77~95	Clamps (77-95)	4.9~5.9 Nm

Tightening torque for hydraulic hoses

Nm (kgf•m)

Dimension (ORS)	Nut type (Metal seal)	Nut type (ORS)
1/8 (-)	7.8~11.8 (0.8~1.2)	--
1/4 (9/16-18)	24.5~29.4 (2.5~3.0)	35.2~43.1 (3.6~4.4)
3/8 (11/16-16)	37.2~42.1 (3.8~4.3)	60.0~73.5 (6.1~7.5)
1/2 (13/16-16)	58.8~63.7 (6.0~6.5)	70.6~86.2 (7.2~8.8)
3/4 (1-14)	117.6~127.4 (12.0~13.0)	105.8~129.4 (10.8~13.2)
1 1/4 (-)	220.5~230.3 (22.5~23.5)	--

Tightening torque for hydraulic pipes

Size of the steel pipe (OD × ID × thickness)	Tightening torque Nm kgf•m	Wrench size (guide number)	Comments
8 × 6 × 1 mm 0.31 × 0.24 × 0.04 in.	29.4~39.2 3.0~4.0	17 mm 0.67 in.	When using a union nut
10 × 7 × 1.5 mm 0.39 × 0.28 × 0.06 in.	39.2~44.1 4.0~4.5	19 mm 0.75 in.	
12 × 9 × 1.5 mm 0.47 × 0.35 × 0.06 in.	53.9~63.7 5.5~6.5	21 mm 0.83 in.	
16 × 12 × 2 mm 0.63 × 0.47 × 0.08 in.	88.3~98.1 9.0~10.0	29 mm 1.14 in.	
18 × 14 × 2 mm 0.71 × 0.55 × 0.08 in.	127.5~137.3 13.0~14.0	32 mm 1.26 in.	
27.2 × 21.6 × 2.8 mm 1.07 × 0.85 × 0.11 in.	235.4~254.97 24.0~26.0	41 mm 1.61 in.	

Tightening torque for hydraulic adapters

Thread size (Pipe union)	Tightening torque Nm kgf•m		Wrench size (guide number)	Comments Steel pipe (OD)	
	R (conical thread)	G (round thread)			
1/8"	19.6~29.4 2.0~3.0	--	17 mm 0.67 in.	When using a steel pipe.	8 mm 0.31 in.
1/4"	36.3~44.1 3.7~4.5	With O-ring Tightening torque for connections 58.8~78.5 6~8	19 mm 0.75 in.		12 mm 0.47 in.
3/8"	68.6~73.5 7.0~7.5	With O-ring Tightening torque for connections 78.5~98.1 8~10	23 mm 0.91 in.		15 mm 0.59 in.
1/2"	83.4~88.3 8.5~9.0	With O-ring Tightening torque for connections 117.7~137.3 12~14	26 mm 1.02 in.		16 mm 0.63 in.
3/4"	166.6~181.3 17.0~18.5				

Tightening torque for elbow pipe joints with shim

Size	Nm	kgf•m
G1/8	15.0~16.5	1.5~1.7
G1/4	24.5~29.4	2.5~3.0
G3/8	49.0~53.9	5.0~5.5
G1/2	58.8~63.7	6.0~6.5
G3/4, G1	117.6~127.4	12.0~13.0
G1, 1/4	220.5~230.3	22.5~23.5
7/8-14UNF	55.9~60.8	5.7~6.2

SAFETY INSPECTION

All safety inspections are based on the national worker's protection regulations, safety regulations and technical specifications applicable to the country where the machine is deployed.

The owner (operator) (page 16) should arrange for the safety inspections to be performed at specified intervals according to national rules and regulations.

Based on their technical training and experience, the qualified personnel should have sufficient knowledge in the domain of the machine described here and be familiar with the applicable national work safety regulations, accident prevention regulations and the generally accepted technical rules so that they can assess the safe condition of the machine.

The qualified person must keep his appraisal and evaluation neutral and must not be influenced by personal, economic or operational interests. The inspection is a visual and functional check of all components for condition and completeness and of the effectiveness of the safety devices.

The performance of the inspection must be documented as an inspection report containing at least the following information:

- Date and scope of the inspection indicating all pending checks,
- Result of the inspection with a report of the determined faults,
- Assessment in respect to starting or continuing operation,
- Information on necessary follow-up inspections and
- Name, address and signature of the inspector.

The owner/employer (company) is responsible for the observance of the inspection intervals. The acknowledgement and the elimination of the determined faults must be confirmed by the owner/employer in writing, along with the date, in the inspection report.

The inspection report must be kept on file at least until the next inspection.

TAKING OUT OF SERVICE AND STORAGE

If the machine is taken out of service for up to six months, the measures before, during and after taking out of service must be carried out as described below. If the vehicle is to be taken out of service for a period of over six months, contact the manufacturer for additional measures.

Safety rules for taking out of service and storage

The general safety rules (page 13), the safety rules for operation (page 73) and the safety rules for maintenance (page 171) apply.

When taking the machine out of service, secure it against unauthorised use.

Storage conditions

The storage place must have a sufficient bearing capacity for the weight of the machine.

The storage place must be frost-free, dry and well ventilated.

Measures before taking out of service

- Clean and dry the machine thoroughly (page 181).
- Check the hydraulic oil level, add hydraulic oil if necessary (page 86).
- Change the engine oil and oil filter (page 188).
- Drive the machine to the storage place.
- Remove the battery (page 207) and store it in a dry and frost-free room. If necessary, connect it to a trickle charger.
- Grease the swivel gear (page 208).
- Grease the pitch bearing (page 208).
- Grease all other greasing points (page 209).
- Grease the swing bracket (page 209).
- Grease the bucket bolt and bucket linkage bolt (page 87).
- Check the antifreeze content of the coolant, add coolant if necessary (page 182).
- Grease the hydraulic cylinder piston rods.

Measures during taking out of service

- Charge the battery regularly (page 206).

Start-up after taking out of service

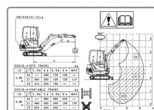
- If necessary, clean the machine thoroughly (page 181).
- Check the hydraulic oil for condensate water. Replace the oil if necessary (page 202).
- Remove the grease from the piston rods of the hydraulic cylinders.
- Install the battery (page 207).
- Check the safety devices for proper operation.
- Carry out the pre-operational services (page 83). If failures are detected during start-up, repair the failures before proceeding..
- If the safety inspection is due while the vehicle has been taken out of service, the inspection must be performed before start-up.
- Start the engine (page 96). Run the machine at idle and check all functions.

LIFTING CAPACITY OF THE EXCAVATOR

Constructive calculation of lifting capacity

- The lifting capacity of the excavator is based on ISO 10567 and does not exceed 75 % of the static tipping load or 87 % of the hydraulic lifting capacity of the machine.
- The lifting capacity is measured at the front pin part of the arm with the arm fully extended. The arm is fully in the dump position. The boom cylinder is the operating cylinder.
- The lifting conditions are:

1. Swivel up to 360°, dozer up and down



The position of the dozer is not relevant to the maximum lifting capacity when swivelling up to 360°. The illustration on the label is representative of both states: Dozer up and down.

2. Over front end, dozer down

3. Over front end, dozer up

- As well as the lifting conditions, the length of the arm also affects the permitted lifting capacities and the stability of the machine. Compare the dimensions of the machine arm with the details given in the lifting capacity tables, in order to use the correct lifting capacity table for your machine.



Dimensions for the arm, see table "Design of arm" in the section "Dimensions" (page 44).

Lifting attachment

- The lifting operation is only permitted when the excavator is equipped with the following safety systems as per EN 474- 5:
 - Pipe safety valve on the boom cylinder (page 32)
 - Pipe safety valve on the arm cylinder (page 32)
 - Overload warning system (page 33)
- If the dozer is being used to increase the machine's stability, an additional pipe safety valve must be installed in accordance with EN 474-1 (page 33).
- The lifting attachment is to be fastened to the attachment or to other parts of the excavator in such a manner as to exclude the possibility of the lifting rope accidentally unhooking.
- The installation on the attachment or the equipment must be such as to guarantee the optimum field of vision between the operator and the guide [the person who fastens the lifting rope to the lifting attachment].
- The lifting attachment is to be positioned so that the lifting rope is not deflected from its vertical direction of tension by other parts of the machine.
- The lifting attachment must be formed and positioned in such a manner as to exclude the possibility of the lifting rope accidentally slipping.
- Care must be taken when positioning the lifting attachment that there is no risk of restriction (e.g. becoming caught on something) during normal operation of the excavator or when working on any particular object.

- Load suspensions (e.g. hooks) may only be welded on by suitably skilled personnel. For this type of work, please contact your KUBOTA dealer.
- At every point of the implement or the boom, the lifting attachment must withstand a load of two-and-a-half-times its rated lifting load.

Load suspension device

Assumed is a load suspension device with all the characteristics listed below:

- The system must withstand a load two-and-a-half-times its rated lifting load, irrespective of the point at which that load is applied.
- The system must be designed in such a way as to practically prevent any objects that have been lifted from falling from the lifting attachment, for example by means of a protective attachment designed for this purpose.
- The system must not allow the lifting attachment to slip from the attachment being lifted.



Do not lift loads which exceed the values indicated in the lifting capacity tables.



Always observe the maximum permissible lifting capacity of the hoisting gear (e.g. load hooks). The lifting of loads over the maximum permissible lifting capacity is not allowed.



The values given in the tables apply only to level and hard grounds. When working on soft ground, the machine can tip over easily, as the load is concentrated on one side only and the track or the dozer can dig into the ground.



The values given in the tables apply only for loads without bucket. If a bucket is used, the weight of the bucket must be subtracted from the values in the tables. The weight of mounted accessories (e.g. clamp kit, quick release coupling, etc.) must be subtracted from the lifting capacity.



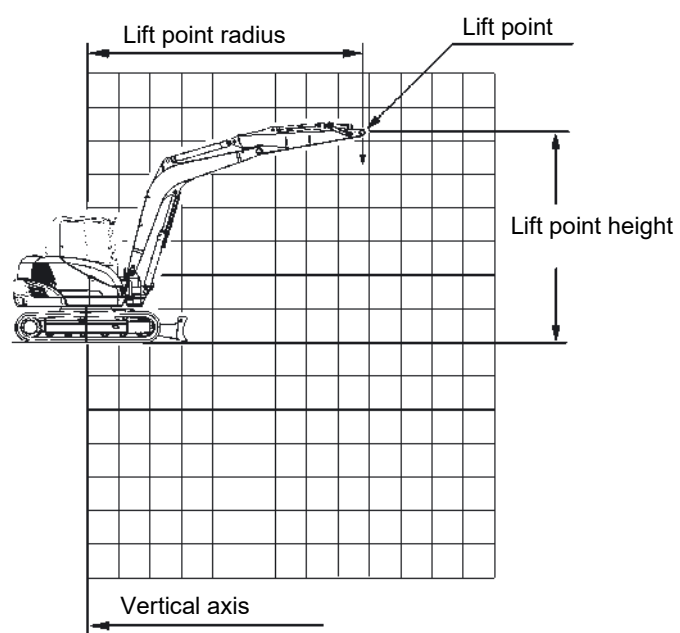
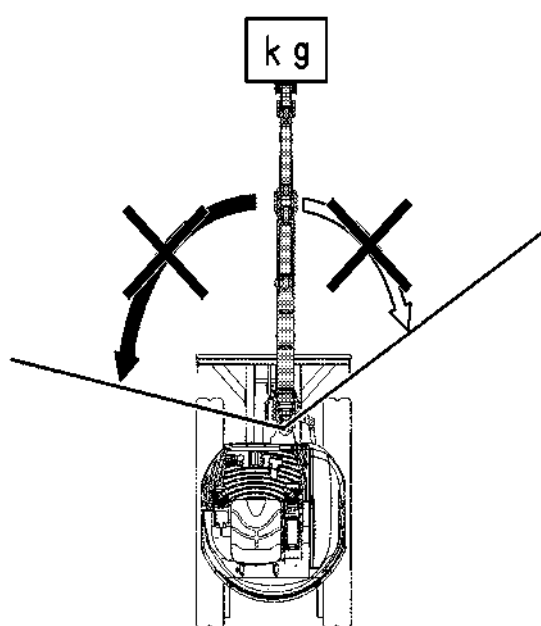
During lifting operations, the boom may not be swung to the left or right. The entire machine could tilt! In order to avoid inadvertent actuation, lower the locking flap for the boom swing pedal.



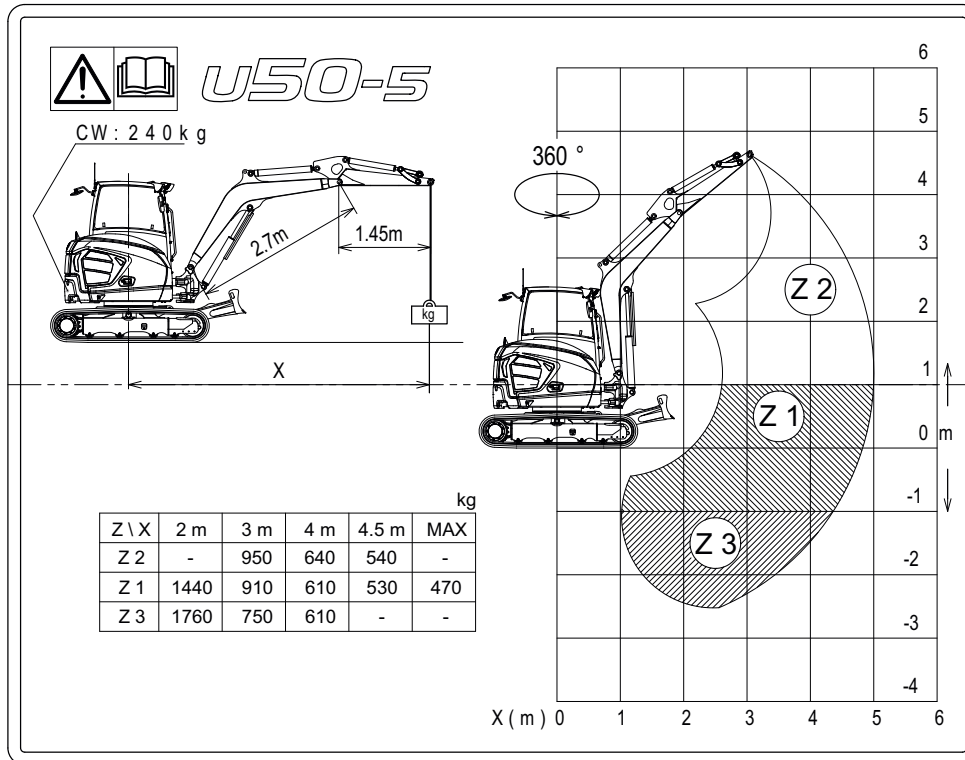
During lifting operations the driving/moving of the crawler chassis is not permitted.

Use utmost care to avoid any risk of tipping, slipping, or other potential risks implied when lifting loads. The operator must

- pick up the load at the centre,
- avoid sudden movements,
- make sure the load does not swing.



Max. lifting load during swivel operation is 360°

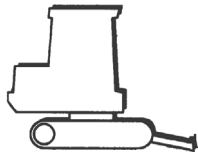


Lifting capacity of the excavator



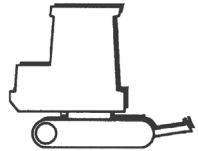
Lifting capacity over front end, dozer down, only with pipe safety valve on the dozer cylinder

MODEL	U50-5	SPEC.	CAB VERSION WITH RUBBER CRAWLER
			ARM 1450 mm

LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											kN (t)
		Mini-mum	1000	1500	2000	2500	3000	3500	4000	4500	5000	Maximum	
GL	4000								10.1 (1.03)				
	3500								10.1 (1.03)	10.2 (1.04)			
	3000							10.8 (1.10)	10.5 (1.07)	10.3 (1.05)	9.8 (1.00)	9.1 (0.93)	
	2500							12.0 (1.22)	11.2 (1.15)	10.7 (1.09)	10.3 (1.06)	9.1 (0.93)	
	2000					19.2 (1.96)	15.6 (1.59)	13.5 (1.38)	12.2 (1.24)	11.3 (1.15)	10.6 (1.08)	9.2 (0.94)	
	1500					24.4 (2.49)	18.4 (1.87)	15.2 (1.55)	13.2 (1.35)	11.9 (1.21)	11.0 (1.12)	9.4 (0.96)	
	1000					28.3 (2.88)	20.7 (2.12)	16.7 (1.70)	14.2 (1.45)	12.5 (1.28)	11.3 (1.15)	9.8 (1.00)	
	500					24.8 (2.53)	22.3 (2.27)	17.8 (1.81)	14.9 (1.52)	13.0 (1.32)	11.5 (1.17)	10.3 (1.05)	
	0				15.2 (1.55)	27.0 (2.75)	22.9 (2.33)	18.3 (1.87)	15.3 (1.56)	13.2 (1.34)	11.5 (1.17)	10.6 (1.08)	
	-500		11.0 (1.12)	15.5 (1.58)	16.2 (1.66)	20.9 (2.13)	29.1 (2.97)	22.6 (2.31)	18.3 (1.87)	15.3 (1.56)	13.0 (1.33)	11.0 (1.13)	10.7 (1.09)
	-1000		16.5 (1.68)	20.3 (2.07)	22.1 (2.25)	27.5 (2.80)	27.4 (2.79)	21.7 (2.21)	17.7 (1.80)	14.7 (1.50)	12.4 (1.26)		
	-1500		17.4 (1.77)	25.6 (2.61)	28.6 (2.92)	32.3 (3.30)	24.8 (2.53)	19.9 (2.03)	16.3 (1.67)	13.5 (1.38)	10.8 (1.10)		
	-2000		20.0 (2.04)	31.8 (3.25)	36.4 (3.71)	26.9 (2.75)	21.1 (2.15)	17.1 (1.75)	14.0 (1.43)	11.0 (1.12)			
	-2500				25.8 (2.63)	19.5 (1.99)	15.8 (1.61)	12.7 (1.30)					

Lifting capacity over front end, dozer up

MODEL	U50-5	SPEC.	CAB VERSION WITH RUBBER CRAWLER
			ARM 1450 mm

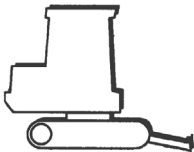
LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)											kN (t)
		Mini-mum	1000	1500	2000	2500	3000	3500	4000	4500	5000	Maximum	
GL	4000								10.1 (1.03)				
	3500								10.1 (1.03)	8.9 (0.90)			
	3000							10.8 (1.10)	10.5 (1.07)	8.8 (0.90)	7.4 (0.75)	7.3 (0.75)	
	2500							12.0 (1.22)	10.5 (1.07)	8.7 (0.89)	7.4 (0.75)	6.9 (0.70)	
	2000					19.2 (1.96)	15.6 (1.59)	12.7 (1.29)	10.3 (1.05)	8.6 (0.88)	7.3 (0.74)	6.6 (0.67)	
	1500					21.0 (2.14)	15.6 (1.59)	12.3 (1.26)	10.1 (1.03)	8.4 (0.86)	7.2 (0.73)	6.4 (0.65)	
	1000					20.0 (2.04)	15.0 (1.54)	11.9 (1.22)	9.8 (1.00)	8.3 (0.84)	7.1 (0.72)	6.3 (0.64)	
	500					19.5 (1.99)	14.6 (1.49)	11.7 (1.19)	9.6 (0.98)	8.1 (0.83)	7.0 (0.71)	6.4 (0.65)	
	0				15.2 (1.55)	19.2 (1.96)	14.4 (1.47)	11.4 (1.17)	9.5 (0.97)	8.0 (0.82)	6.9 (0.71)	6.5 (0.66)	
	-500		11.0 (1.12)	15.5 (1.58)	16.2 (1.66)	20.9 (2.13)	19.1 (1.95)	14.3 (1.45)	11.3 (1.16)	9.4 (0.96)	8.0 (0.81)	6.9 (0.70)	6.8 (0.69)
	-1000		16.5 (1.68)	20.3 (2.07)	22.1 (2.25)	27.5 (2.80)	19.2 (1.96)	14.2 (1.45)	11.3 (1.15)	9.3 (0.95)	7.9 (0.81)		
	-1500		17.4 (1.77)	25.6 (2.61)	28.6 (2.92)	29.5 (3.01)	19.3 (1.97)	14.3 (1.46)	11.3 (1.16)	9.4 (0.96)	8.0 (0.82)		
	-2000		20.0 (2.04)	31.8 (3.25)	36.4 (3.71)	26.9 (2.75)	19.5 (1.99)	14.4 (1.47)	11.4 (1.17)	9.5 (0.97)			
	-2500				25.8 (2.63)	19.5 (1.99)	15.8 (1.61)	12.7 (1.30)					

Please note the model name and operating weight on the type plate (page 50).

Lifting capacity over front end, dozer down, only with pipe safety valve on the dozer cylinder

MODEL	U50-5	SPEC.	CAB VERSION STEEL CRAWLER
			ARM 1450 mm

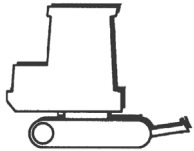
kN (t)

LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)										
		Mini- mum	1000	1500	2000	2500	3000	3500	4000	4500	5000	Maxi- mum
GL	4000								10.1 (1.03)			
	3500								10.1 (1.03)	10.2 (1.04)		
	3000							10.8 (1.10)	10.5 (1.07)	10.3 (1.05)	9.8 (1.00)	9.1 (0.93)
	2500							12.0 (1.22)	11.2 (1.15)	10.7 (1.09)	10.3 (1.06)	9.1 (0.93)
	2000					19.2 (1.96)	15.6 (1.59)	13.5 (1.38)	12.2 (1.24)	11.3 (1.15)	10.6 (1.08)	9.2 (0.94)
	1500					24.4 (2.49)	18.4 (1.87)	15.2 (1.55)	13.2 (1.35)	11.9 (1.21)	11.0 (1.12)	9.4 (0.96)
	1000					28.3 (2.88)	20.7 (2.12)	16.7 (1.70)	14.2 (1.45)	12.5 (1.28)	11.3 (1.15)	9.8 (1.00)
	500					24.8 (2.53)	22.3 (2.27)	17.8 (1.81)	14.9 (1.52)	13.0 (1.32)	11.5 (1.17)	10.3 (1.05)
	0				15.2 (1.55)	27.0 (2.75)	22.9 (2.33)	18.3 (1.87)	15.3 (1.56)	13.2 (1.34)	11.5 (1.17)	10.6 (1.08)
	-500	11.0 (1.12)	15.5 (1.58)	16.2 (1.66)	20.9 (2.13)	29.1 (2.97)	22.6 (2.31)	18.3 (1.87)	15.3 (1.56)	13.0 (1.33)	11.1 (1.13)	10.7 (1.09)
	-1000	16.5 (1.68)	20.3 (2.07)	22.1 (2.25)	27.5 (2.80)	27.4 (2.79)	21.7 (2.21)	17.7 (1.80)	14.7 (1.50)	12.4 (1.26)		
	-1500	17.4 (1.77)	25.6 (2.61)	28.6 (2.92)	32.3 (3.30)	24.8 (2.53)	19.9 (2.03)	16.3 (1.67)	13.5 (1.38)	10.8 (1.10)		
	-2000	20.0 (2.04)	31.8 (3.25)	36.4 (3.71)	26.9 (2.75)	21.1 (2.15)	17.1 (1.75)	14.0 (1.43)	11.0 (1.12)			
	-2500			25.8 (2.63)	19.5 (1.99)	15.8 (1.61)	12.7 (1.30)					

Lifting capacity over front end, dozer up

MODEL	U50-5	SPEC.	CAB VERSION STEEL CRAWLER
			ARM 1450 mm

kN (t)

LIFT POINT HEIGHT [mm]		LIFT POINT RADIUS (mm)										
		Mini- mum	1000	1500	2000	2500	3000	3500	4000	4500	5000	Maxi- mum
GL	4000								10.1 (1.03)			
	3500								10.1 (1.03)	9.1 (0.93)		
	3000							10.8 (1.10)	10.5 (1.07)	9.1 (0.93)	7.6 (0.78)	7.6 (0.77)
	2500							12.0 (1.22)	10.8 (1.11)	9.0 (0.92)	7.6 (0.77)	7.1 (0.72)
	2000					19.2 (1.96)	15.6 (1.59)	13.1 (1.33)	10.6 (1.08)	8.9 (0.90)	7.5 (0.77)	6.8 (0.69)
	1500					21.6 (2.20)	16.1 (1.64)	12.7 (1.29)	10.4 (1.06)	8.7 (0.89)	7.4 (0.76)	6.6 (0.67)
	1000					20.6 (2.10)	15.5 (1.58)	12.3 (1.26)	10.1 (1.03)	8.5 (0.87)	7.3 (0.75)	6.5 (0.67)
	500					20.1 (2.05)	15.1 (1.54)	12.0 (1.23)	9.9 (1.01)	8.4 (0.86)	7.2 (0.74)	6.6 (0.67)
	0				15.2 (1.55)	19.8 (2.02)	14.8 (1.51)	11.8 (1.21)	9.8 (1.00)	8.3 (0.85)	7.2 (0.73)	6.7 (0.68)
	-500	11.0 (1.12)	15.5 (1.58)	16.2 (1.66)	20.9 (2.13)	19.8 (2.02)	14.7 (1.50)	11.7 (1.19)	9.7 (0.99)	8.2 (0.84)	7.1 (0.73)	7.0 (0.71)
	-1000	16.5 (1.68)	20.3 (2.07)	22.1 (2.25)	27.5 (2.80)	19.8 (2.03)	14.7 (1.50)	11.7 (1.19)	9.6 (0.98)	8.2 (0.84)		
	-1500	17.4 (1.77)	25.6 (2.61)	28.6 (2.92)	30.5 (3.11)	19.9 (2.02)	14.7 (1.51)	11.7 (1.19)	9.7 (0.99)	8.3 (0.85)		
	-2000	20.0 (2.04)	31.8 (3.25)	36.4 (3.71)	26.9 (2.75)	20.1 (2.05)	14.9 (1.52)	11.8 (1.21)	9.8 (1.00)			
	-2500			25.8 (2.63)	19.5 (1.99)	15.8 (1.61)	12.7 (1.30)					

Please note the model name and operating weight on the type plate (page 50).

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