OPERATION MANUAL

MINI EXCAVATOR

ViO27-6

YANMAR

Fill in the following information before starting the machine	
Model	
Machine serial number	
Engine serial number	
Year of manufacture	
Start-up date	
Your YANMAR dealer Adress Telephone	
This user manual is protected by copyright. Do not duplicate, disclose or use, either fully or partially, without prior written consent.	

Original instructions

Language:	EN
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Manual code:	MUB16DENMA00103

From the serial number: YCEVIO27JJCM06801

Yanmar Construction Equipment Europe S.A.S.
25 rue de la Tambourine, 52115 ST-DIZIER, FRANCE
www.yanmar.com

YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S. THANK YOU FOR PURCHASING A YANMAR MACHINE

Read this manual carefully to find out how to use and maintain your machine correctly.

If the safety rules are not respected, injury may be caused or the equipment may be damaged.

This manual must be considered as a permanent part of your machine and must not be separated from the machine when you sell it.

This machine has been designed metrically. The measurements contained in this manual are also metric.

Only use metric equipment and tools.

The right and left hand sides are determined by facing the forward movement direction.

The warranty is a part of the YANMAR product support programme for customers who use and maintain their equipment as described in this manual. If the equipment has been used incorrectly or modifications have been made to transform its perfomances beyond the original factory specifications, the warranty expires and the improvements on site under warranty are rejected. The use of fuel beyond the specifications required or modifying the power of the machine's engine will void the warranty.

All the information, illustrations and specifications contained in this manual are based on the latest product information available on publication. YANMAR reserves the right to modify the information and illustrations in this manual without notice. For any further information, please contact your approved YANMAR dealer.

The images that appear in this booklet are provided for information purposes and may vary according to each model.

⚠ WARNING

Never try to run or use this machine without having read and understood all the applicable security messages contained in this manual.

Injury may be caused if the safety messages are not respected.

To ensure that this manual remains available for other users, always put it back in its compartment when it is not being used.

DECLARATION OF CONFORMITY

The undersigned YANMAR C.E. Europe SAS, 25 rue de la Tambourine, 52115 ST-Dizier FRANCE states that the designated machine:

Description - Generic name - Function - Model - Type - Serial number - Trade name

VIO27XX – VIO27-6 – MINI EXCAVATOR – VIO27-6 – VIO – XXXXXXXX – VIO27-6

Special equipment:

- XXXX
- XXXX

*** complies with the provisions of the following European directivesand the national legislations implementing them.**

- 2006/42 EC
- 2014/30 EU
- 97/68 EC
- 2004/26 EC
- 2000/14 EC+ 2005/88 EC

Procedures applied for conformity assessment are: NF EN ISO 3744; NF ISO 6395

Notified Body: CETIM Centre Technique des Industries Mécaniques 52, avenue Félix Louat – CS 80067 – 60304 SENLIS Cedex FRANCE

Net power output 15,2 kW * 2500 rpm

Measured sound power	92,3 dBA
Guaranteed sound power	93 dBA

Name and address of the person established in the European community, authorized to compile the technical file and transmit it in whole or part to the public authorities in response to a reasonable request:

YANMAR C.E. Europe SAS – 25, rue de la Tambourine 52115 SAINT DIZIER CEDEX –FRANCE

*** The following documents were used in the design of the machine:**

- Harmonised standards:

EN 474–1; EN 474–5;

Done at Saint-Dizier, the XX/XX/XXXX

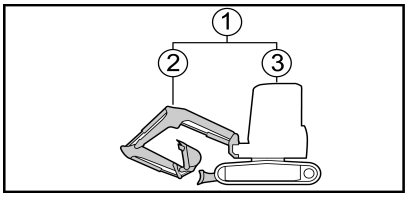
INTRODUCTION

This User Manual has been designed to provide you with important information and the suggestions you need for safe and effective use of the machine.This document is an original manual. Read the manual before you use the machine to familiarise yourself with the operation, verification and maintenance procedures and instructions.A serious accident may be caused if you do not respect the precautions contained in this user manual or use any procedures that are not recommended.

⚠ DANGER

Incorrect use of the machine may cause serious injury or even death. Personnel involved in using and maintaining the machine must familiarise themselves with the content of this manual before carrying out a task.

- Do not start the machine before you have familiarised yourself with the content of this manual.
- The personnel responsible for using the machine must keep this manual within easy reach and consult it from time to time.
- If you lose or damage the manual, order a new one immediately from your dealer.
- When you sell the machine to another user, do not forget to pass on the manual at the same time.
- YANMAR provides its customers with products that conform to the regulations and industrial standards that apply in their respective countries. If you are using a YANMAR machine that you have bought from a foreign company, you should be aware that certain safety mechanisms may be missing from the machine. Consult your dealer to find out whether your machine complies with the regulations and industrial standards that apply in your country.
- Some of the machine's specifications may differ from those described in the manual because the machine's design and performances have been improved. If you have any comments to make concerning the content of the manual, do not hesitate to consult your dealer.
- When the machine and its accessories are exported to another country, comply with the laws and regulations on export and trade control.
- The important safety instructions are presented in this manual in sections:
  - **1 Basic precautions, page 73**
  - **2 Usage precautions, page 78**
- In this manual, the main product sections are designated as follows:



(1) **Machine** = whole product
(2) **Equipment** = part including the arm, the boom, the bucket or any other accessory
(3) **Basic machine** = part comprising the upper structure and the lower frame

SAFETY SIGNALS

The following signals are used in this manual to indicate the severity of the risks that may be encountered if the warnings concerning the product are not respected :

⚠ **DANGER**	Dangerous situation imminent that may cause death or serious injury.
⚠ **WARNING**	Potentially dangerous situation likely to cause death or serious injury.
⚠ **CAUTION**	Potentially dangerous situation likely to cause slight or medium-seriousness injury .
⚠ **IMPORTANT**	Remarks or instructions to be respected to ensure the completely safe operation and maintenance of the machine.

⚠ WARNING

The operator of this machine must be competent and trained in its use.

⚠ WARNING

Never try to operate or repair the machine if you have not read and understood all the applicable warnings and usage instructions contained in this manual and on the safety signals on this machine. Physical injury may be caused if the safety instructions are not respected.

⚠ WARNING

Never modify the design of the machine or its engine.

Never remove or deactivate the protections or safety mechanisms installed.

Any unauthorised modification to the design or use of unauthorised accessories may cause physical damage.

In addition, in that these actions would constitute an explicit violation of the terms of the YANMAR Product Warranty, the applicable warranty would also become null and void.

Table of content

A Description and illustration of the machine

Chapter covered in this part:

1 APPLICATIONS AND REGULATIONS

1.1 Applications

The machine is designed to carry out the following tasks:

- Excavation
- Ground levelling
- Shovelling
- Trench digging and ridging
- Loading
- Lifting (optional)

⚠ CAUTION

The machine must not be used for any tasks that are not covered.

⚠ CAUTION

It is forbidden to transport or lift people with the machine.

1.2 Warranty

Refer to the maintenance book.

1.3 Driving permits

Before using this machine, check the requirements applicable to its use concerning the driving permits. Respect all applicable laws. See your dealer for questions about usage permits.

1.4 Lifting

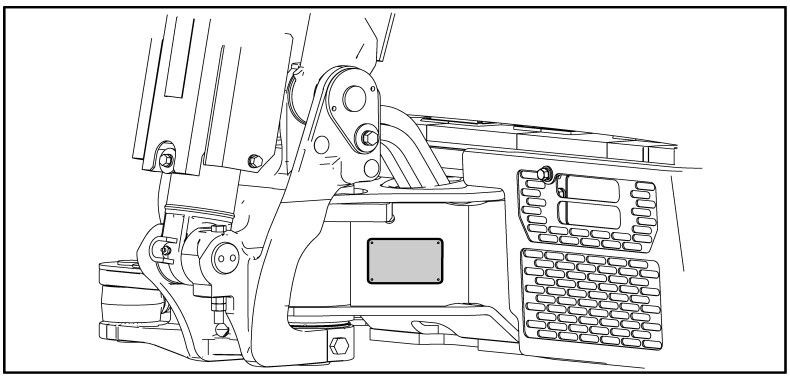
- Using the machine as a hoist is subject to the Machinery Directive 2006/42/EC for members of the European Community, and to the legislations specific to each country for states outside the EC.

  YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S. declines all responsibility for any use of the machine that does not respect the instructions in this regulation.

- Consult your YANMAR dealer for more information about the lifting function.

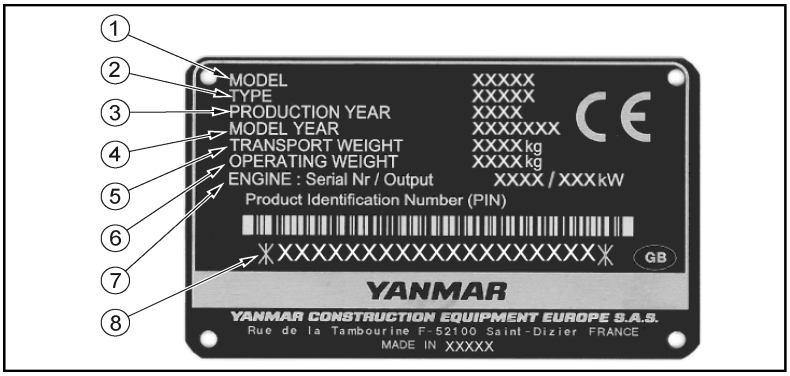
2 IDENTIFICATION PLATES

2.1 Machine serial number plate



The machine's serial number plate is located on the rotating frame, as shown opposite.

Never remove this plate for any reason.



1 = Model name

2 = Type (Machine Category)

3 = Date of manufacture of the machine

4 = Model year

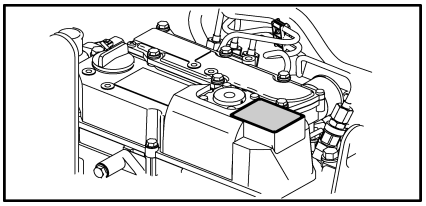
5 = Transport weight
(Machine weight without operator, equipped with a standard bucket and tanks topped off)

6 = Weight of the machine
(with operator +75 kg)

7 = Serial number and engine power

8 = Machine serial number

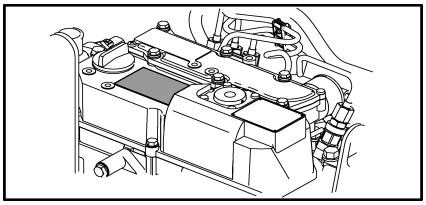
2.2 Engine serial number plate

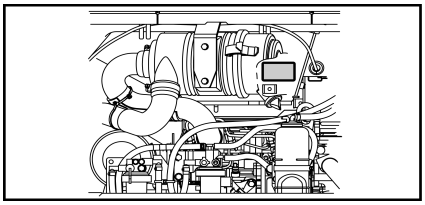


The engine's serial number plate is located on the top of the cylinder head cover and on the adhesive label located inside the bonnet. Never remove this plate for any reason.

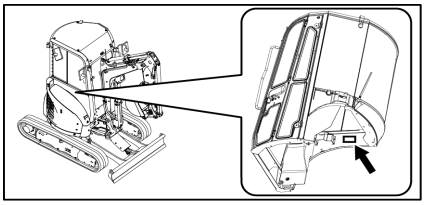
2.3 EPA information plate

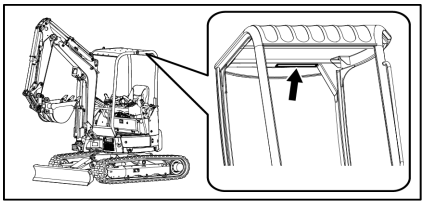
The EPA information plate is attached to the engine. Never remove this plate for any reason.





2.4 Safety structure plate

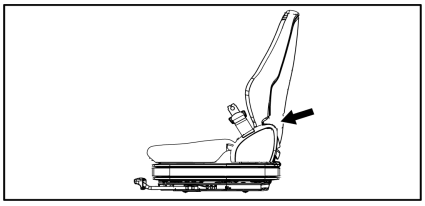




The safety structure plate is located inside the cockpit on the cab/canopy.Never remove this plate for any reason.

2.1.3 Check the safety structures, page 80

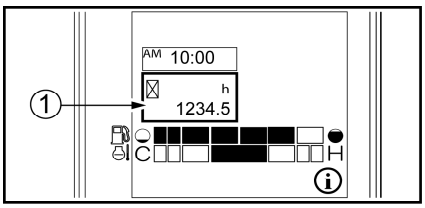
2.5 Seat identification



The seat identification is located behind the seat. Never remove it for any reason.

2.6 Spare parts order and intervention request

When you order spare parts or call for an inervention, tell your dealer the model name, the serial number of the machine and the serial number of the engine and the number of hours displayed on the time counter.



1 = Time counter

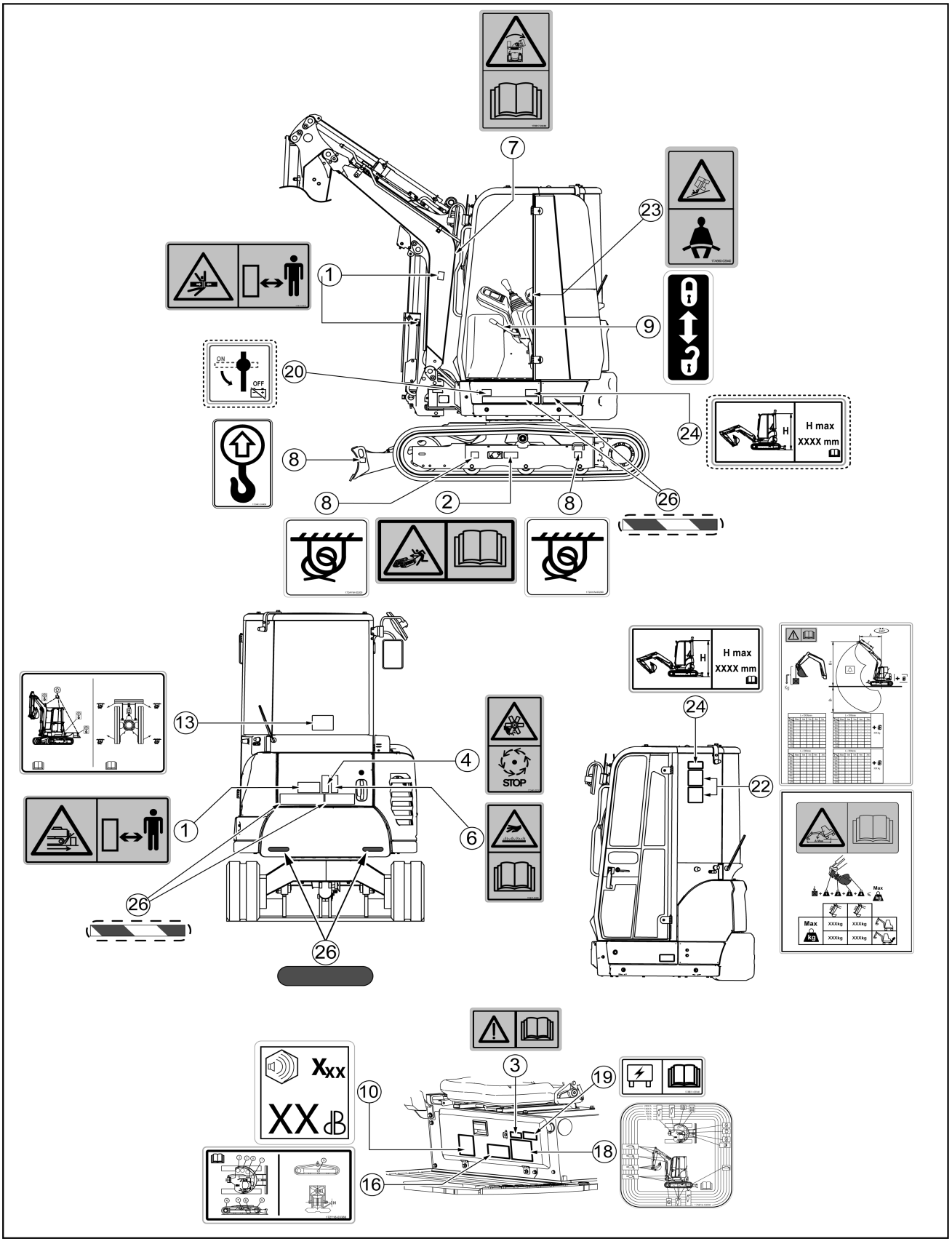
3 WARNING LABELS

- Several safety messages are configured on the machine.The description and location of all the safety messages are provided in this chapter. Check regularly to see whether all the messages are in the correct location and are legible.
- If an adhesive label is missing, damaged or illegible, replace it straight away. In the same way, if an adhesive label is on a part that has been replaced, add a new adhesive label to the new part.
- Contact your YANMAR dealer to obtain new adhesive labels. The part code number is clearly indicated on each label.

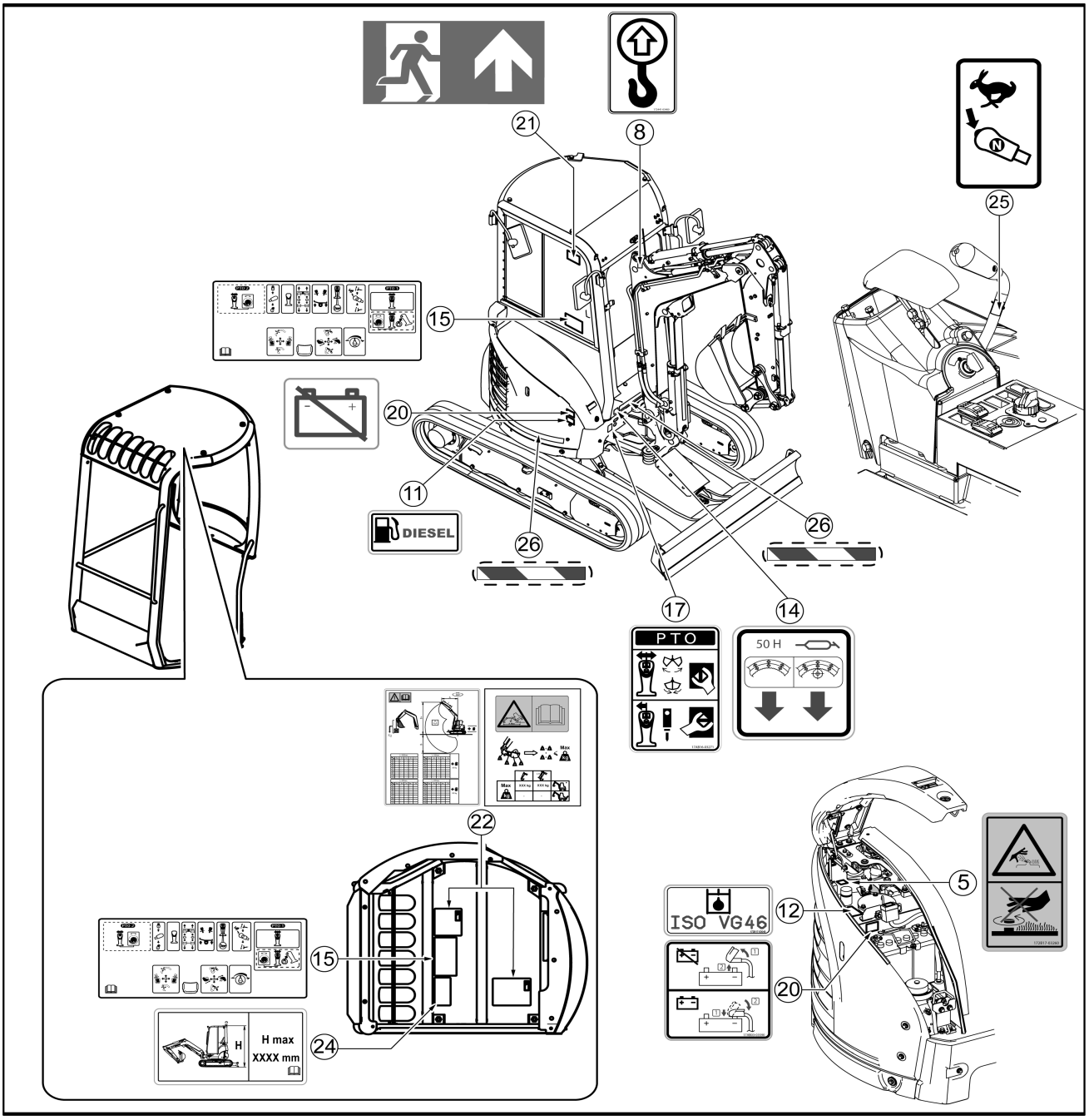
[ ] = Options

3 Warning labels

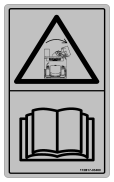
3.1 Location of the warning adhesive labels

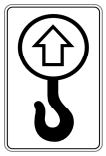
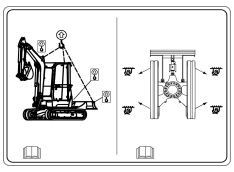
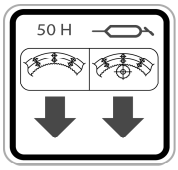
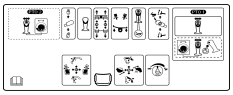
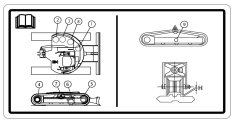


3 Warning labels

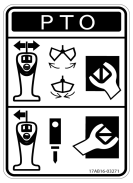
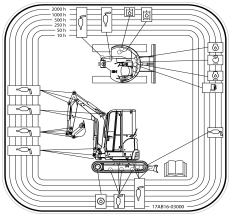
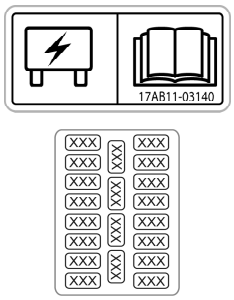
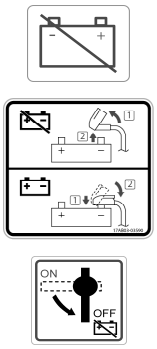
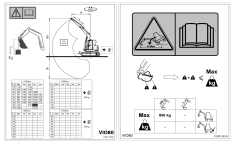


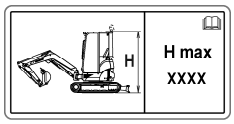
3.2 Explanation of the warning adhesive labels

1		Machine's Danger Zone **2.2 Movement precautions, page 82** **2.2.1 Machine's Danger Zone, page 82** **1.2.4 Dismantling the accessory, page 148**
2		Pressurised product. Read the user manual. **4.1.5 Rubber track maintenance, page 161** **4.1.6 Steel track maintenance, page 166**
3		Read the user manual. **2 Usage precautions, page 78** **2.1.5 Accessing the machine, page 81**
4		Do not remove the protective casings while the machine is running. **1.2.9 Radiator ventilator, page 149**
5		Pressurised elements. **1.8 Avoid removing the caps when the temperatures are high, page 75**
6		Hot surfaces. **3.3 Checking and topping up the engine oil level, page 98**
7		Interference between the bucket and the machine. **9.2 Compatible accessories, page 116**

8	 	Transporting the machine **14.3 Tying down the machine, page 129** **14.4 Slinging the machine, page 131**
9		**5.3.1 Locking lever , page 27**
10		Guaranteed sound power **3 Noise emitted by the machine, page 185**
11		Fuel **3.4 Checking and topping up the fuel level, page 99**
12		Hydraulic oil **3.5 Checking and topping up the hydraulic oil level, page 100** **2 Recommended greases and fluids, page 150**
13		Tie-down and slinging plans for the machine **14 Transporting the machine, page 127**
14		**4.2.1 Greasing the pin and rotation crown, page 169**
15		This sticker describes the operation of the machine controls and their location relative to the operator seat. **5.3 Joysticks and pedals, page 26**
16		Filler holes for various reservoirs on the machine and track tension system. **2 Recommended greases and fluids, page 150** **4.1.5 Rubber track maintenance, page 161**

3 Warning labels

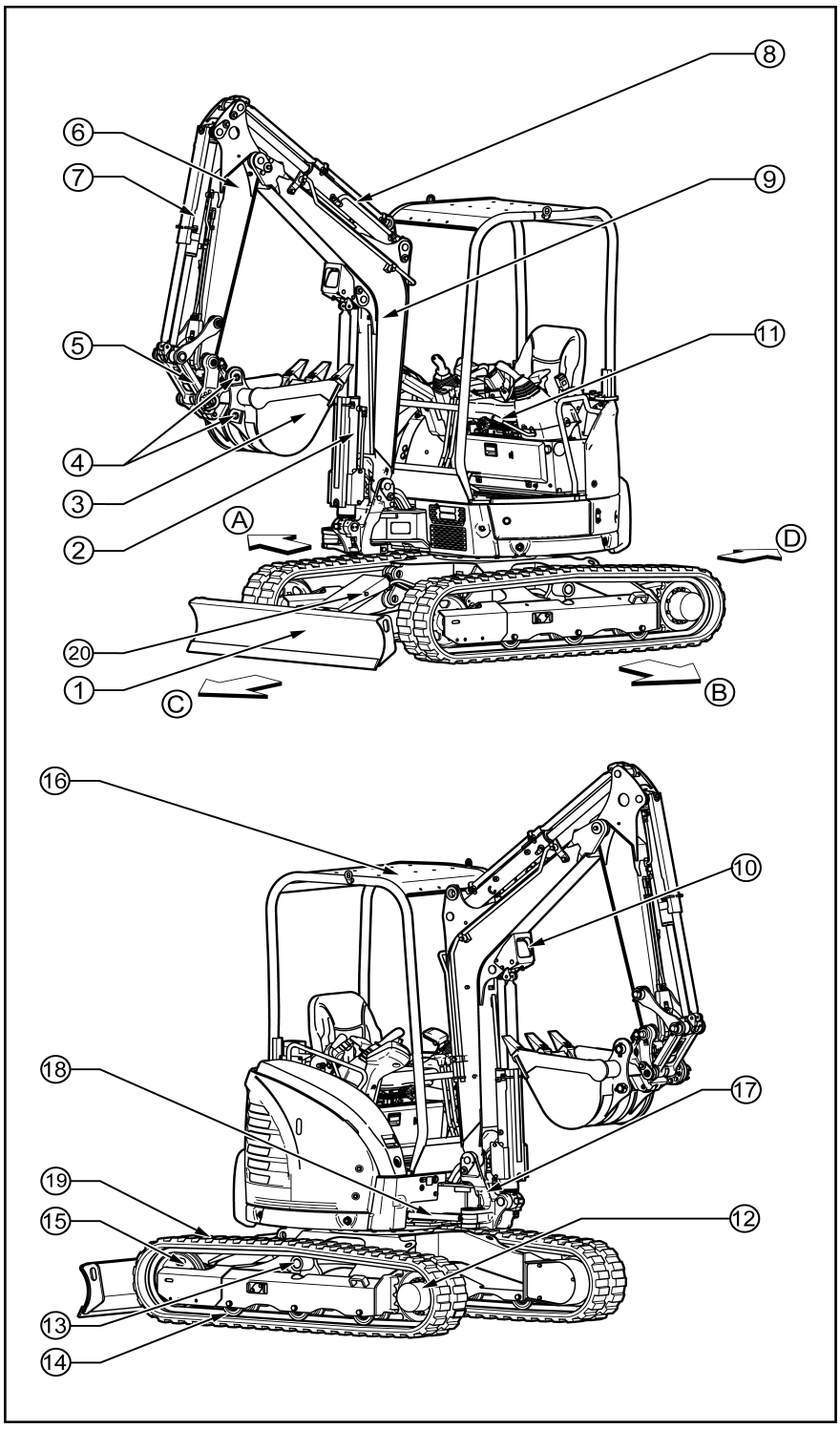
17		Use this valve to select the 3rd hydralulic circuit in single or dual effect. **13.1.1 3rd circuit selector, page 125**
18		Scheduled maintenance points of the machine (lubrication, filters...) **3 Periodic inspections and upkeeps, page 154**
19		Fusebox **5.8 Fuses, page 34**
20		Circuit breaker: This switch is used to disconnect the battery directly. **8.5 Circuit breaker, page 49**
21		Cabin's emergency exit **1.14 Cabin's emergency exit, page 77**
22		The maximum weight when in use in bucket mode or with accessories that ensures machine dynamic stability in use. It corresponds to the maximum weight allowed at the end of the empty arm. **9.1 Machine stability when using with a bucket or an accessory, page 113**
23		Always fasten your safety belt and adjust it before starting the machine. **2.1.6 Fasten your safety belt and adjust the rearview mirror (s), page 81**

24		Before transporting the machine, check the total height of the load. **14.3 Tying down the machine, page 129**
25		To switch to 2nd gear, press the switch on the blade lever. **5.2.8 2nd gear switch, page 25** Throttle lever
26		Reflective strips make the machine more visible in the dark.

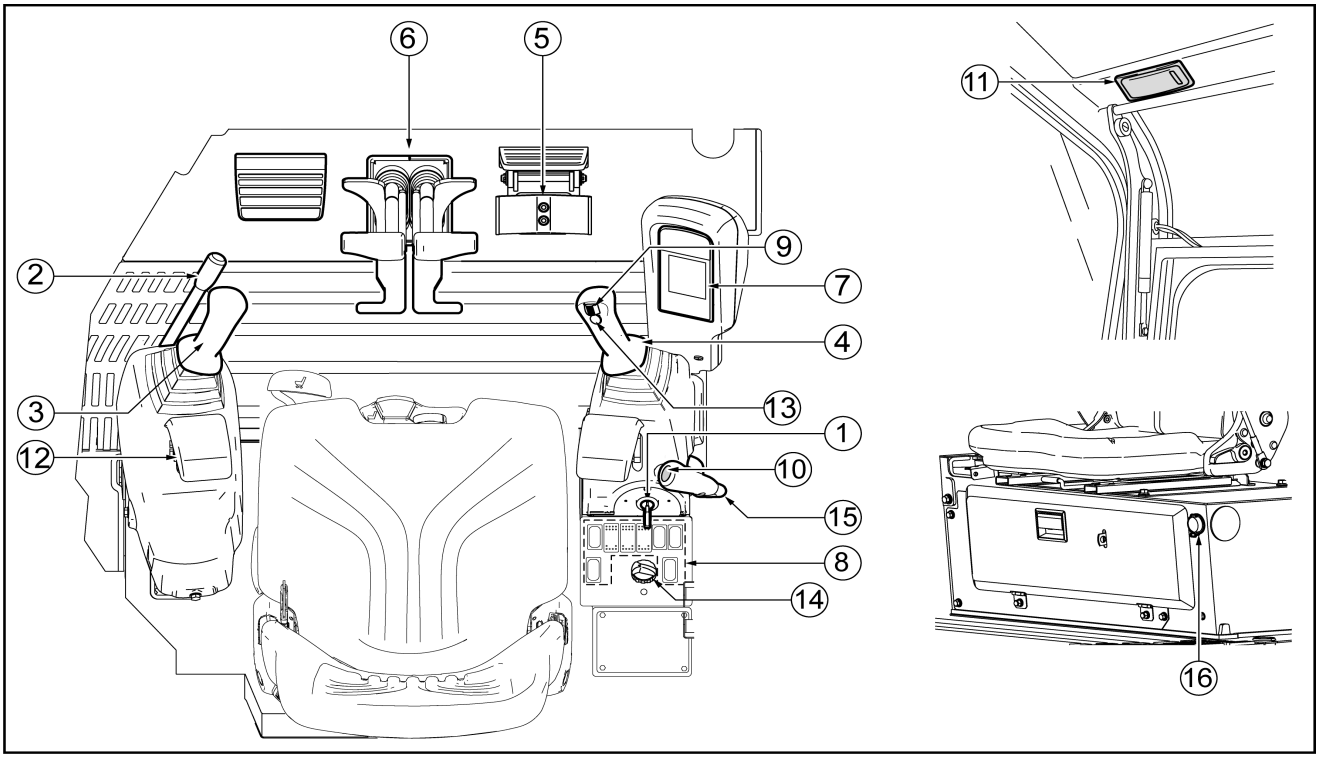
4 IDENTIFICATION OF IMPORTANT PARTS

4.1 General view of the machine

A = Right
B = Left
C = Front
D = Rear
1 = Blade
2 = Boom cylinder
3 = Bucket
4 = Axis
5 = Bucket link
6 = Arm
7 = Bucket cylinder
8 = Arm cylinder
9 = Boom
10 = Work lamp
11 = Locking lever
12 = Sprocket wheel
13 = Support roller
14 = Track roller
15 = Idle wheel
16 = Canopy
17 = Boom base
18 = Boom rotation cylinder
19 = Track
20 = Blade cylinder



4.2 Commands and switches



1 = Start key
2 = Locking lever
3 = Left command lever
4 = Right command lever
5 = Boom rotation pedal
6 = Travel levers and pedals
7 = Operator display station
8 = Control panel
9 = 3rd hydraulic circuit control
10 = 2nd gear switch
11 = Interior lighting switch
12 = Armrest
13 = Horn
14 = Engine rate control
15 = Blade lever
16 = Power socket

5 Description of the driving position

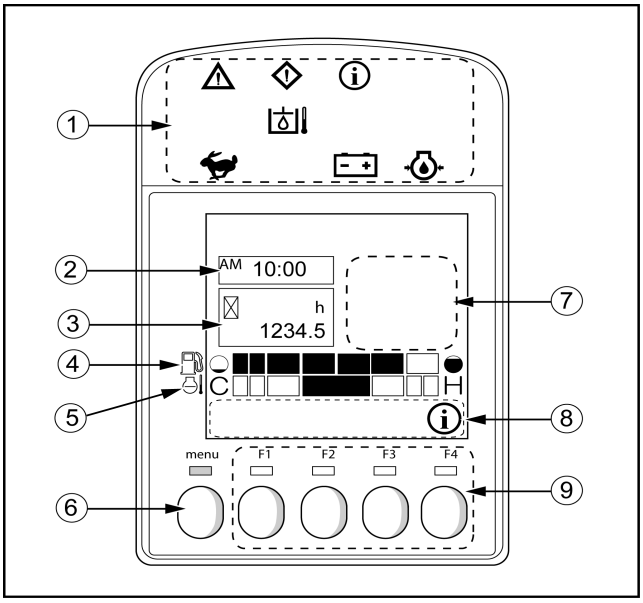
This section describes the different command mechanisms necessary to operate the machine. In order to work in complete safety and comfort, it is vital that you understand how to operate and use these mechanisms.

5.1 Operator display station

- When the starter key is in ON position, the lights come on and the alarm sounds. If one of the indicators does not light, its lamp is blown or its sensor faulty.
- All the lights go off after the engine is started. If a problem occurs when starting, a light comes on and the alarm sounds.

⚠ WARNING

When an indicator light comes on and the alarm sounds during operation, stop the engine immediately and follow the steps recommended in this manual.



1 = Indicator lights
2 = Clock
3 = Time counter
4 = Diesel gauge
5 = Cooling fluid temperature indicator
6 = Menu change
7 = Information and error icons
8 = Indication of functions
9 = Keys F1 to F4

For the advanced features on the operator display station:

6 Operator LCD display station interfaces, page 104

5.1.1 Indicator lights

Warning light (red)	Alert light (orange)	Information symbol (blue)	
	Hydraulic oil temperature gauge (red)		
Increased speed (green)		Battery charge warning alert (red)	Engine oil pressure alert indicator (red)

a. Warning light

If the warning light flashes and the alarm sounds continuously, immediately stop using the machine. After stopping the machine, check the error details and take corrective measures.

b. Alert light

If the alert light blinks and the alarm sounds intermittently, stop the machine as soon as possible. After stopping the machine, take the necessary corrective measures.

c. Information symbol

The information indicator will flash to indicate the presence of information such as maintenance indications. Press F4 to view the details.

d. Hydraulic oil temperature gauge

This indicator lights only at startup and it does not have any function on this machine.

e. Travel speed indicator

Increased speed

This indicator shows that the 2nd gear is engaged.

f. Battery charge warning alert

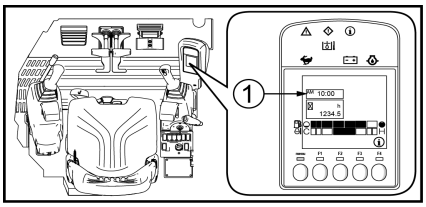
- If the battery is not correctly charged, the warning light will come on.
- In this case, check the battery charge circuit.
- If you detect any faults, contact your dealer.

g. Engine oil pressure alert indicator

If the engine oil pressure is abnormal, the warning light comes on and the buzzer sounds. In this case, shut down the engine

15.2.1 Engine, page 133

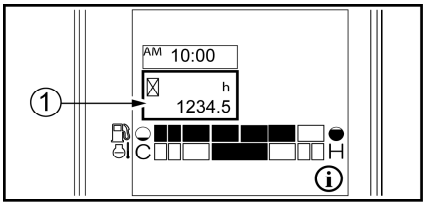
5.1.2 Clock



1 = Clock

- The clock displays the current time.
- The time can be displayed in 12-hour (AM/PM) or 24-hour format.

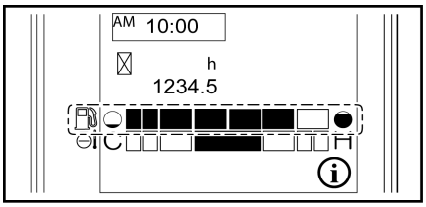
5.1.3 Time counter



1 = Time counter

- The time counter indicates the number of hours for which the machine has been working.
- Reading this time counter will help you define the intervals between maintenance operations.
- When the engine is running, the time counter permanently records the time even if the machine is not being used.
- The time counter records "1" for one hour without considering the engine rotation speed.
- The decimal to the far right records"1" for 0.1 hours (6 minutes).

5.1.4 Diesel gauge



● = Full

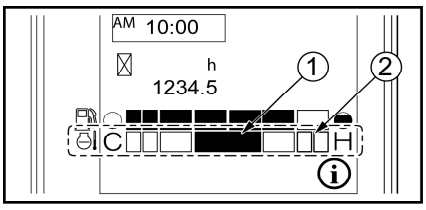
○ = Empty

- The diesel gauge operates when the starter key is in ON position. It indicates the level of diesel in the tank.
- When the gauge reaches the two indicators near the symbol "Empty" (the leftmost cubes), fill up as soon as possible.

Note

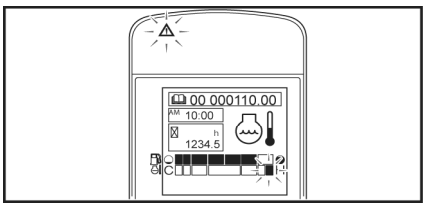
The gauge indication is affected by the level of machine tilt.

5.1.5 Cooling fluid temperature indicator



C = cold

H = hot



- It indicates the temperature of the engine cooling fluid. The normal temperature is close to zone (1) during normal operation.
- If the temperature of this coolant reaches the limit (2) during working, then slow the engine down and wait for it to return to normal.
- When the engine is cold, top up with cooling fluid following the procedure described in chapter

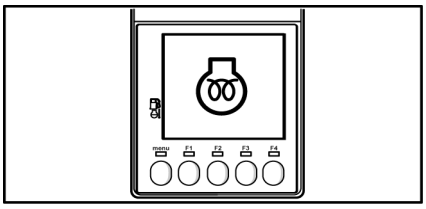
3.2 Checking and topping up the level of cooling fluid, page 97

5.1.6 Preheating light

IMPORTANT

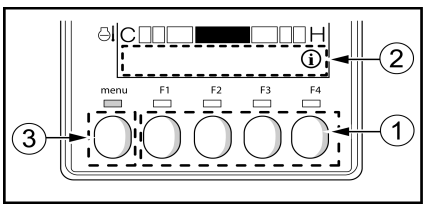
Do not leave the key in START position for over 10 seconds.

If the engine does not start, position the key at OFF. Wait 30 seconds then restart the engine.



- When the start switch is in the ON position and pre-heat the symbol appears on the monitor screen, hold the key in the ON position until the symbol is no longer displayed.

5.1.7 Navigation keys



1 = Keys F1 to F4

2 = Indication of functions

3 = Menu change

Keys F1 to F4

- Use these buttons to launch the operations corresponding to the icons displayed above the function indicator bar.

6.1 Indication of functions, page 104

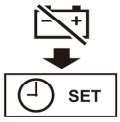
Menu change

- Press the "Menu Change" button to access the main menu.

6 Operator LCD display station interfaces, page 104

5.1.8 Information and error icons

Date and time setting indicator



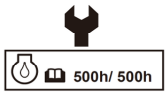
- The time and date must be set from the settings screen.

Note

If the battery in the machine is removed, the date and time settings will be reset.

6 Operator LCD display station interfaces, page 104

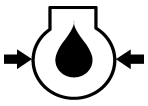
Maintenance notice



- This icon indicates on the basis of the machine's accumulated hours of use that the maintenance period for an maintenance object has been reached. Required maintenance must be performed after referring to the maintenance section of this manual.
- When the maintenance has been performed, the accumulation of maintenance time must be reset from the maintenance interface.

3 Periodic inspections and upkeeps, page 154

Engine oil pressure alert indicator



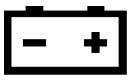
- If the engine oil pressure is abnormal, the warning light comes on and the buzzer sounds. In this case, shut down the engine

15.2.1 Engine, page 133

Fuel level

- This icon indicates a low fuel level in the tank.

Battery charge warning alert



- If the battery is not correctly charged, the warning light will come on.
- In this case, check the battery charge circuit.
- If you detect any faults, contact your dealer.

Water temperature alarm light

- When the starter key is in ON position, the light comes on and goes off a few seconds later.
- If the temperature rises abnormally during operation, the light comes on and the alarm sounds indicating that the engine is overheating.
  1. Slow the engine for a while then shut it down.
  2. When the engine is cold, top up with cooling fluid following the procedure described in chapter

3.2 Checking and topping up the level of cooling fluid, page 97

Engine stop icon

- If the control panel displays this icon alternately with another icon, stop the engine immediately.

Take the necessary corrective measures.

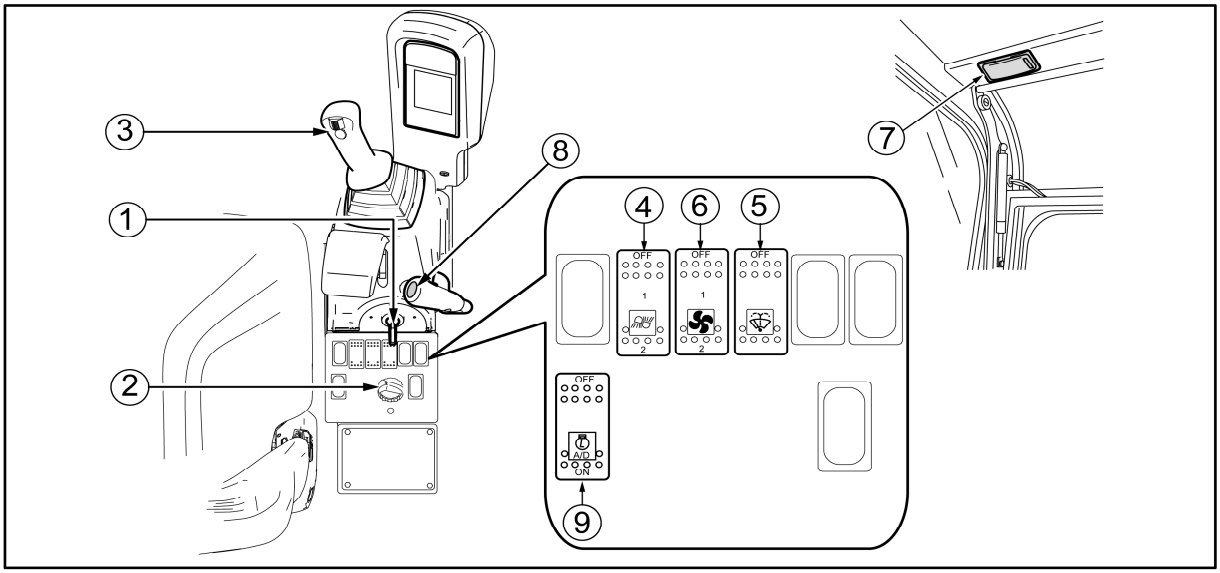
Error icon

- This icon indicates an error other than those described above.
- Contact your dealer and provide the error code displayed on the LCD.

Other errors

- In case of problems on the machine different from that already described, if the warning light is flashing and the STOP icon appears on the operator display station as well an error code, stop the machine immediately and contact your dealer.

5.2 Switches



1 = Start key
2 = Engine rate control
3 = Horn
4 = Headlight switch
5 = Windscreen wiper switch and windscreen wiper (for cab)
6 = Ventilation switch (for cab)
7 = Interior lighting switch
8 = 2nd gear switch
9 = Engine slow down switch

5.2.1 Start key

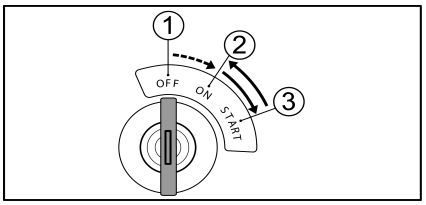
⚠ IMPORTANT

The machine is fitted with an electrical safety system. If the locking levers are not in safety position, the engine cannot start.

⚠ IMPORTANT

Before starting the machine, check that the locking lever is in the upper position to start safely.

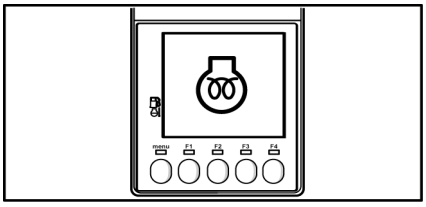
- Use this command to start and stop the engine.



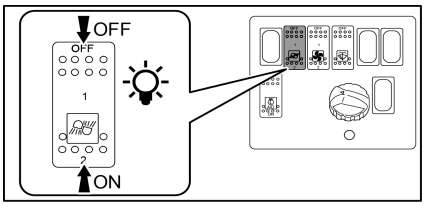
1 = OFF

2 = ON

3 = START

OFF position = shutdown	Turn the key to OFF position to switch off the engine and disconnect the electrical circuit.
ON position = operation 	Turn the key to the ON position to turn on the power circuit and the charging circuit. Keep the key in this position while the engine is running. When the start switch is in the ON position and preheat the symbol appears on the monitor screen, hold the key in the ON position until the symbol is no longer displayed.
START position = startup	Turn the key to START position to start the engine. Release the key after the engine starts and it will return itself to ON position. **⚠ WARNING** **To protect the starter and battery :** **• Do not keep the ignition key more than 10 seconds in the START position.** **• If the engine does not start, move the ignition key to the OFF position and wait 30 seconds before trying to start the engine.**

5.2.2 Headlight switch

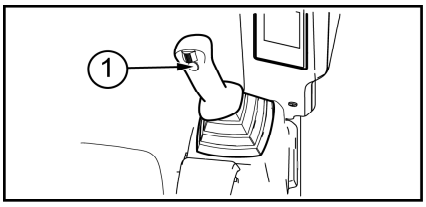


⚠ IMPORTANT

Do not leave the headlights switched on when the engine is not running. The battery will discharge and the engine will be unable to start.

- ON = The headlights come on.
- OFF = The headlights switch off.

5.2.3 Horn



• Press the switch at the top of the right joystick to activate the horn.

1 = Horn

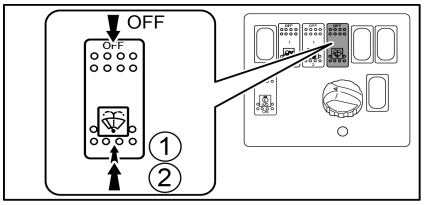
5.2.4 Windscreen wiper switch and windscreen wiper

IMPORTANT

Do not press the washer command when the washer tank is empty as this may damage the pump.

Using windscreen wipers on a dry windscreen may damage the glass. Only use the windscreen wipers when the windscreen is wet.

The windscreen wiper blade may freeze in cold weather. Do not try to activate it if it is frozen as this may damage the windscreen wiper motor.



• This switch is used both for the windscreen wipers and the washer.

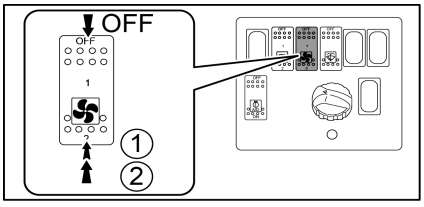
1 = The windscreen wipers work.

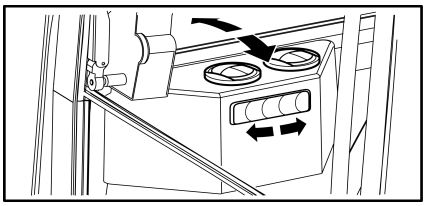
2 = Press the switch to spray wiper fluid onto the windscreen.

OFF = The windscreen wipers stop.

• Check the windscreen washer fluid level daily.

5.2.5 Ventilation switch





• Use this switch to evacuate the air from the cab. Press the switch to select the ventilator speed.

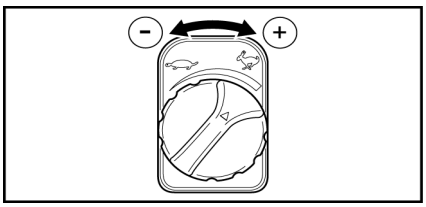
• The selector is used to select the air volume by selecting :

– OFF = Ventilator stopped.

– 1 = Reduced ventilator speed.

– 2 = High ventilator speed.

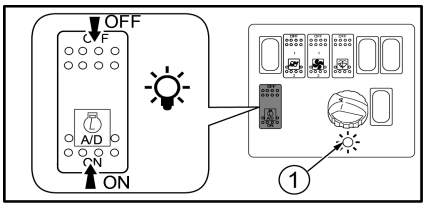
5.2.6 Engine rate setting



- Turn the switch to the left to decrease the engine speed.
- Turn it clockwise to increase engine speed.

5.2.7 Engine slow down switch

- Use this switch to automatically reduce engine speed.
- When the auto-idle switch is ON and the machine controls are in neutral, the engine speed is automatically reduced after 4 seconds.
- If you use the machine controls, the engine speed will automatically returns to the speed set by the engine speed knob.



ON = Auto-idler activated The switch indicator is on.

OFF = Auto-idler deactivated The switch indicator is off.

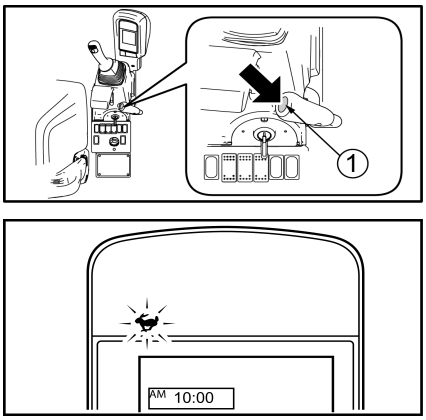
1 = Automatic engine running slow indicator

⚠ IMPORTANT

When the starter key is in ON position, the light comes on and goes off a few seconds later.

The indicator light flashes in the event of an anomaly with the engine idle system. Contact your dealer.

5.2.8 2nd gear switch

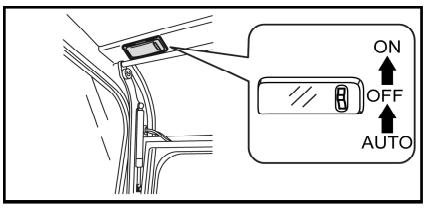


- To switch to 2nd gear, press the switch on the blade lever. The 2nd gear indicator lights on the LCD monitor.

1 = 2nd gear switch

- Press the second gear switch again to return to normal speed. The light goes out.

5.2.9 Interior lighting switch



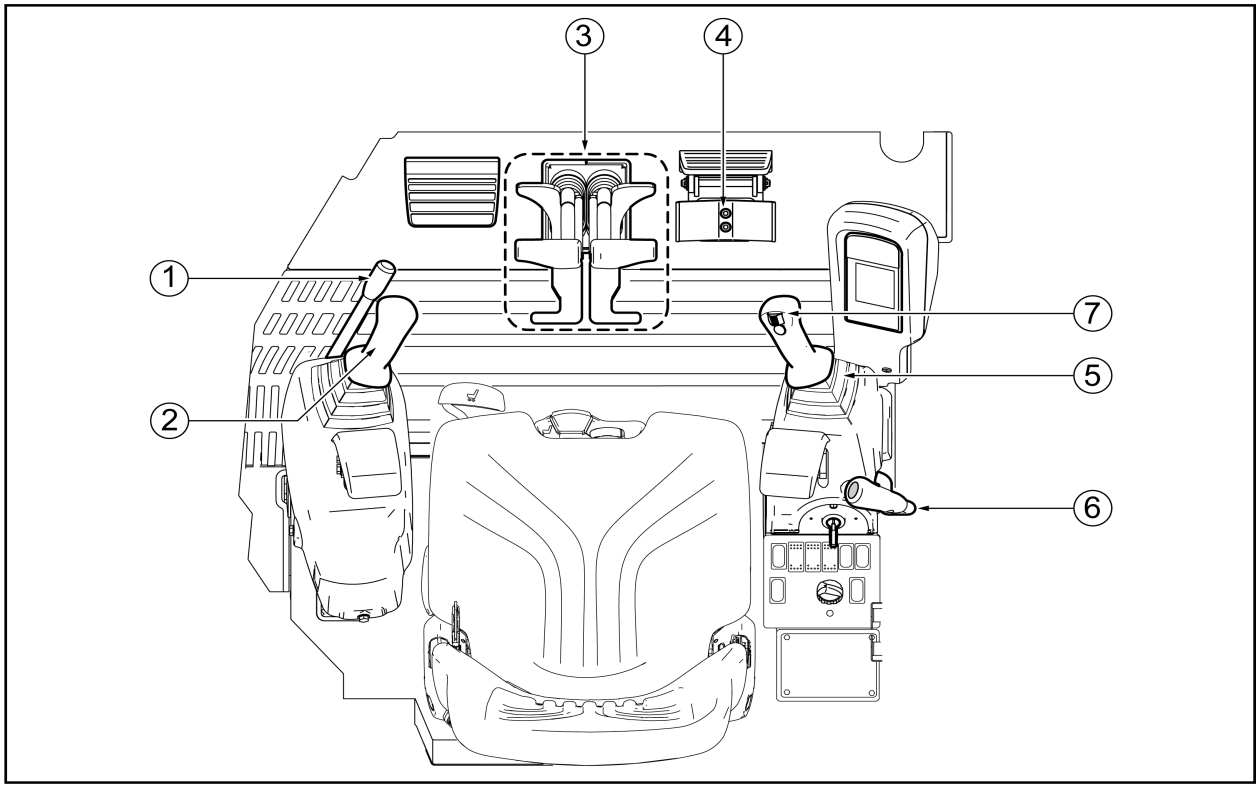
- The interior lighting may be activated when the starter key is in ON position.

ON = The lighting is activated.

OFF = The lighting is desactivated.

Auto = At the opening of the door, a timer switches the interior lights on for 15 seconds. The interior light automatically turns off when the cabin door is closed.

5.3 Joysticks and pedals



1 = Locking lever

2 = Left command lever

3 = Travel levers and pedals

4 = Boom rotation pedal

5 = Right command lever

6 = Blade lever

7 = P.T.O. switch

5.3.1 Locking lever

⚠ WARNING

Make sure the security system is operating when accessing the machine or leaving the operator's seat.

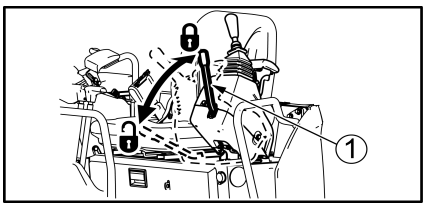
⚠ WARNING

The movement relationship between the command lever mechanism and the equipment movements thay produce are described in detail in this manual. To avoid any accidents due to handling errors, it is prohibited to modify the hydraulic circuit when reconnecting the hydraulic cylinder hoses and valves.

- The machine is equipped with locking lever(s) controling the hydraulic security system.
- When raising the locking lever to operate the security system, the lever stand raises for an easier access to the driving position.
- In locked position, the security system condemn the control devices of the machine.

⚠ WARNING

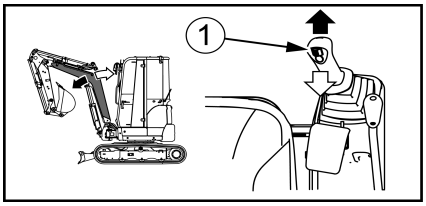
The blade movement is not secured by the locking lever, even when the latter is in the locked position.



1 = Locking lever

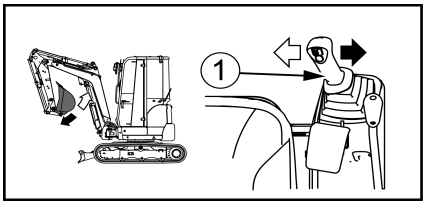
5.3.2 Right command lever

- The right hand command lever is used to handle the boom and the bucket.



Handling the boom

1 = Right command lever



Handling the bucket

1 = Right command lever

- When you release the lever, it returns to neutral position and the respective movements stop.

5.3.3 3rd hydraulic circuit control (P.T.O. 1)

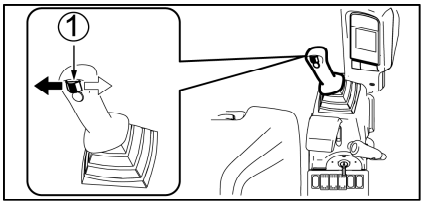
P.T.O. switch

- Use the proportional roller to adapt the dual effect P.T.O. rate.

13 Implementing the 3rd hydraulic circuit, page 125

– ⬅ Single action accessory (hammer) : activate the switching lever while pressing the switching pedal.

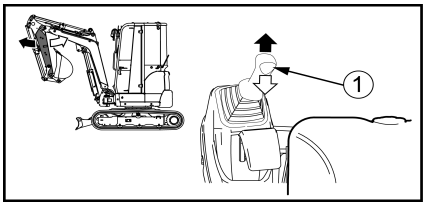
– ⬅⇨ Dual action accessory (tilt bucket, auger, etc.) : operate only the proportional roller.



1 = Proportional roller

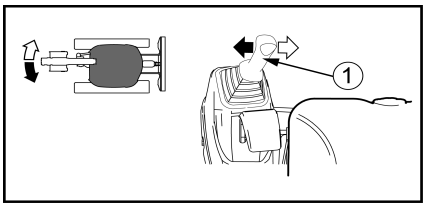
5.3.4 Left command lever

- The left hand joystick is used to control the arm movements and the rotation of the upper part.



Handling the arm

1 = Left command lever



Rotation of the upper part

1 = Left command lever

- When you release the lever, it returns to neutral position and the respective movements stop.

5.3.5 Travel levers and pedals

⚠ DANGER

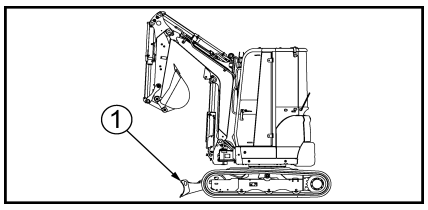
Incorrect use of the machine may cause serious injury or even death. Personnel involved in using and maintaining the machine must familiarise themselves with the content of this manual before carrying out a task.

⚠ WARNING

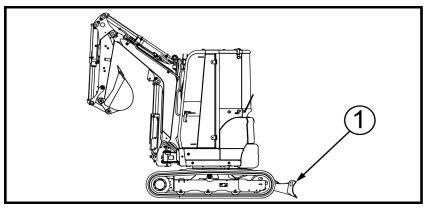
Before handling the travel levers, check whether the machine is in normal or reverse position. The machine is in the normal position when the blade is on the same side as the work equipment.

If the machine is in the reverse position, the displacement levers must be handled in reverse to move forward and backward.

Normal position

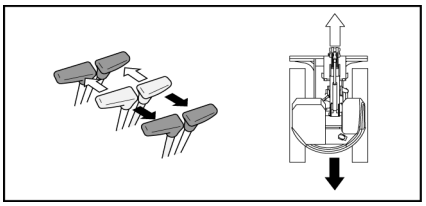


Opposite position



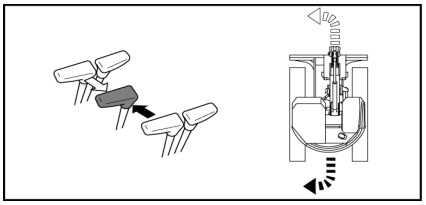
1 = Blade

5 Description of the driving position



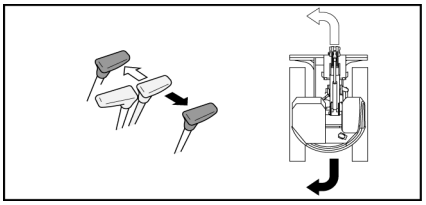
- To move the machine forward, push the travel levers, or press the front of the pedals.

To move the machine backwards, pull the travel levers, or press the back of the travel pedals.



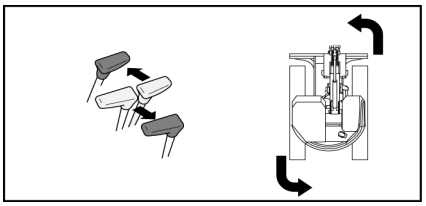
- To turn to the left with the machine moving:
  1. Position the travel levers forward or rearward.
  2. Turn the travel lever left into neutral to turn the machine.

To turn right, do the same thing with the right travel lever.



- To turn to the left with the machine stopped:
  1. Position the travel levers in the neutral position.
  2. Push the right travel lever to rotate forward or pull the right travel lever to turn backwards.

To turn right, do the same thing with the left travel lever.



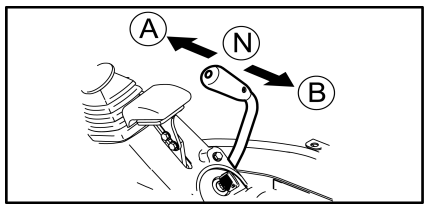
- To make a rotating turn of the machine to the left:
  1. Position the travel levers in the neutral position.
  2. Push the right travel lever forward and pull the left travel lever rearward.

To make a rotating turn of the machine to the right, reverse the operation of the levers.

5.3.6 Blade lever

⚠ WARNING

Do not operate the blade lever when you are not using it.



A = Lower the blade.

B = Raise the blade

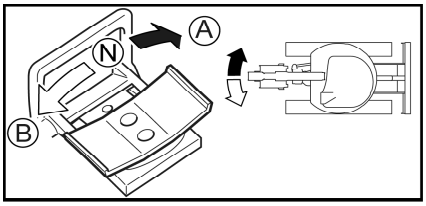
N = Neutral

- Use this lever to command the blade.
- Push the lever forward to lower the blade.
- Pull the lever back to raise the blade.
- If the lever is released, it return to neutral position and the blade remains in its position.
- Use the switch on the blade lever to switch to second gear.

5.2.8 2nd gear switch, page 25

5.3.7 Boom rotation pedal

- Use this pedal to pivot the boom to the left or right.



A = Rotate right: press right

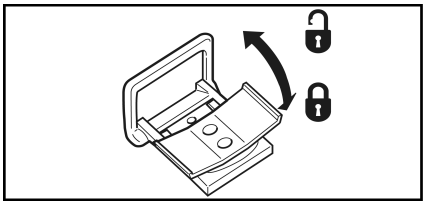
B = Rotate left: press left

N = If the pedal is released, it returns to the neutral position and the boom keeps its position.

Protection of pedals

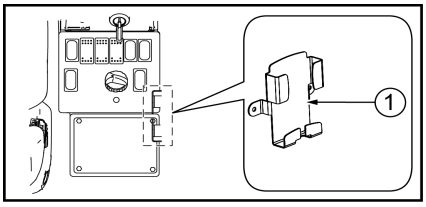
⚠ WARNING

To avoid the risk of any inappropriate or involuntary use, always place the pedals in locked position when they are not being used.



- Fold the protection to lock the pedal. It may then be used as a foot rest.

5.4 Telephone housing



1 = Telephone housing

- The telephone can be lodged in the telephone housing during recharging.

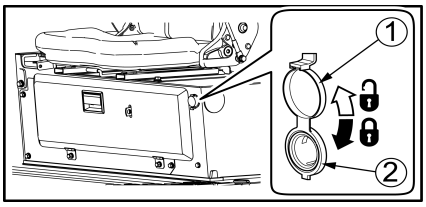
5.5 Power socket, page 32

5.5 Power socket

IMPORTANT

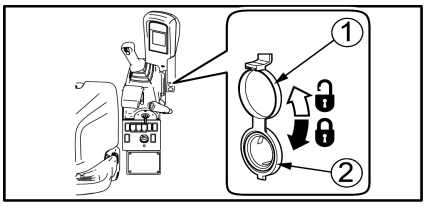
Always close the lid if the plug is not used to seal for dust.

Prolonged use when the engine is switched off may damage the battery.



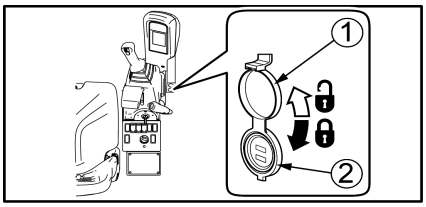
1 = Lid

2 = Power socket



- The power sockets work when the ignition key is in the ON position. Appliances up to 12V-120W (10A) may be connected.

USB ports



- The machine has USB ports enabling electrical equipment to be charged.

1 = Lid

2 = USB ports

5.6 Driver's seat

⚠ WARNING

Do not adjust the seat position when you are working on the machine; adjust it before you start.

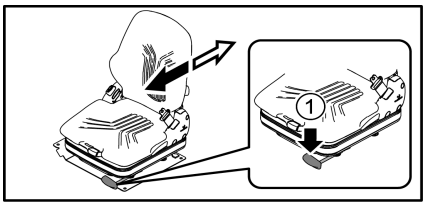
Always fasten your safety belt and adjust it before starting the machine.

- Adjust the seat position so that the driver can operate the controls easily and comfortably.

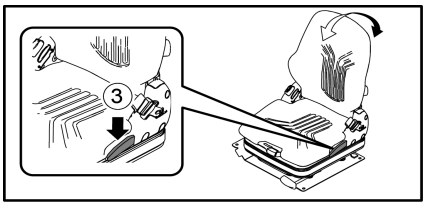
Note

The seat adjustment controls vary according to the type of seat installed in the machine.

Seat position adjustment

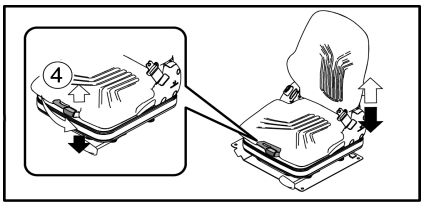


• Pull the lever (1) to move the seat forward and back.



• Pull lever (3) to adjust the seat back.

Suspension adjustment

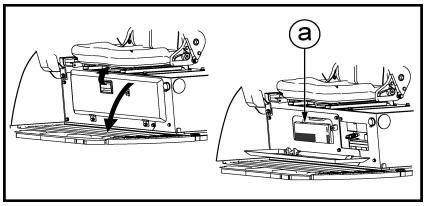


• The seat suspension (4) can be adjusted according to the weight of the driver:

– ⇨ Firm suspension

– ⇦ Flexible suspension

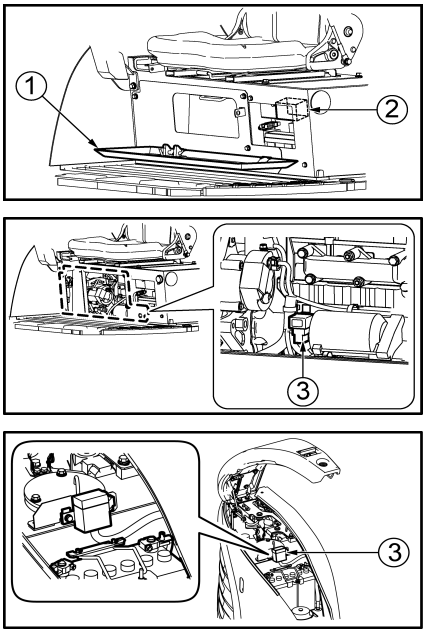
5.7 Location for the user manual



• The location for the user manual is under the driver's seat.

a = User manual

5.8 Fuses



- The fuses protect the equipment and the electrical cabling against a surge. In case of a bad contact, or if the electrical system does not work when the key is on, replace the faulty fuse with a fuse in good condition.

4.3.1 Fuse replacement, page 170

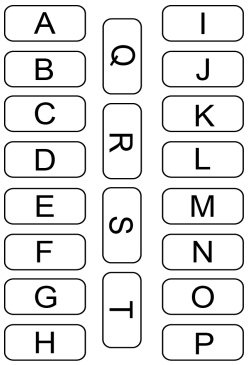
- The fusebox is underneath the driver's seat.

1 = Storage box cover

2 = Fusebox

3 = Delayed action fuses

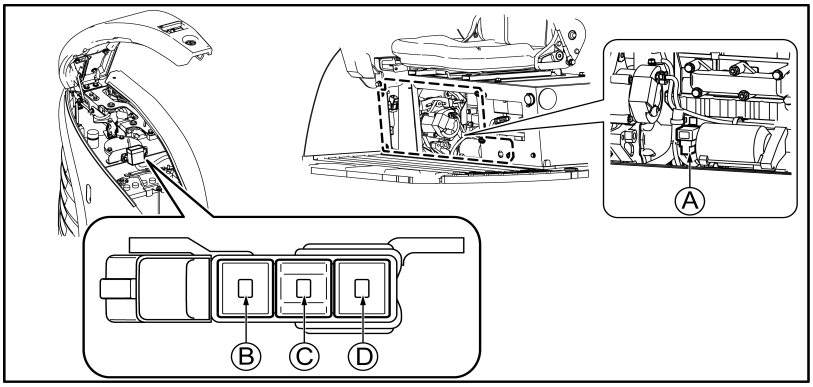
5.8.1 Fusebox



Symbol	Fuse capacity	Circuit name
A	5	Starter Preheating relay Engine control relay
B	15	Cab headlight Rear light
C	15	Cigar lighter
D	2	Power relay
E	5	Travel alarm Relay SMARTASSIST-REMOTE (SA-R)
F	10	Engine Electric engine fuel supply pump
G	10	Immobilizer Cut-off valve
H	15	Options Overload switch
I	15	Heating (for cab)
J	25	Radio Power socket Windscreen wiper
K	5	Interior lighting Flashing light
L	5	Operator display station Horn
M	10	Options
N	5	Automatic engine idle
O	15	Right command lever Left command lever
P	2	Boom headlamp
Q	5	Spare fuses
R	10	
S	15	
T	25	

5 Description of the driving position

General supply fuses



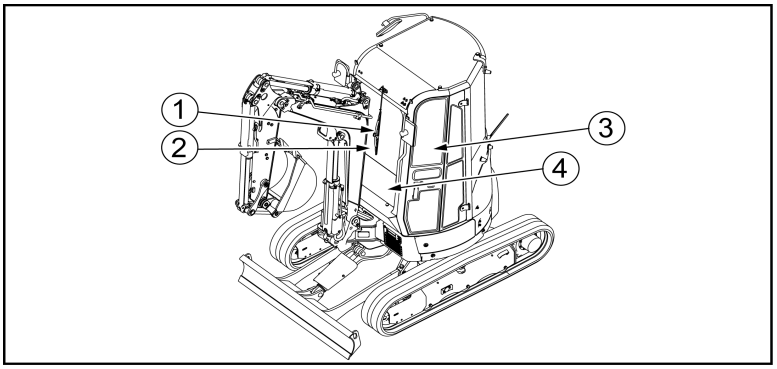
Symbol	Fuse capacity	Circuit name
A	60A	Alternator
B	60A	Glow plugs
C	60A	Starter
D	60A	Main circuit

5.9 Cabin

⚠ CAUTION

The upper and lower parts of the windscreen can be opened. The opening and closure of the windscreen must be secured with the safety levers in order to avoid any sudden, unplanned closure which may cause injuries:

Do not pass your hand or head through the open door or windscreen.

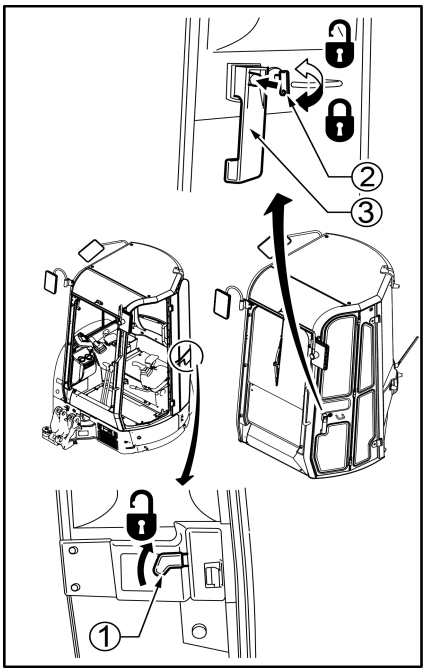


1 = Windscreen wiper
2 = Upper windscreen
3 = Side door
4 = Lower windscreen

⚠ CAUTION

Place the locking lever(s) in locked position to avoid any unplanned operation of the joysticks when handling the windscreen.

5.9.1 Cab side door



1 = Interior handle
2 = Key
3 = Exterior handle

a. Opening and closing of the door

From the exterior

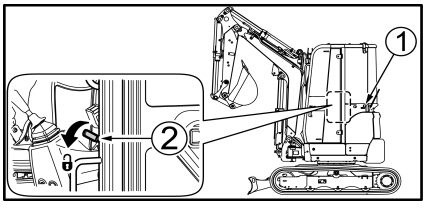
- To open the door :
  1. Insert the key into the lock.
  2. Turn the key anti-clockwise to unlock the door.
  3. Press the button on the exterior handle to open the door.
- To close the door :

Slam the door and turn the key clockwise to lock it.

From the interior

- Pull the interior handle to open the door.

b. Locking the door



1 = Cylindrical lock
2 = Handle

To lock the door:

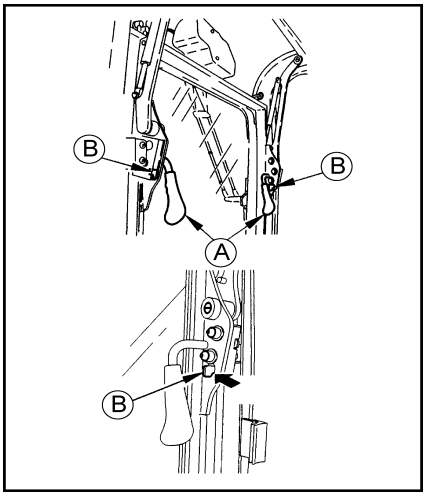
1. Open the door.
2. Press the locking section of the side door to lock it in open position.

To unlock the door:

1. Pull the handle to disengage the cylindrical lock.
2. Close the door with the handle.

5.9.2 Upper windscreen

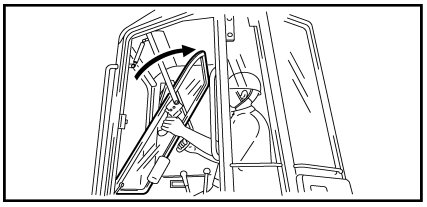
Opening of the upper part of the windscreen



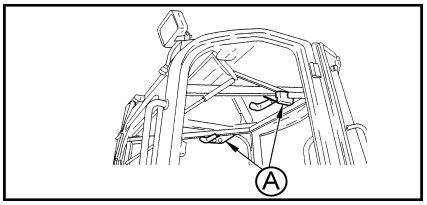
1. Grasp the handles and push the levers to the right and left of the window until you hear a click for them to unlock.

A = Handle

B = Lever



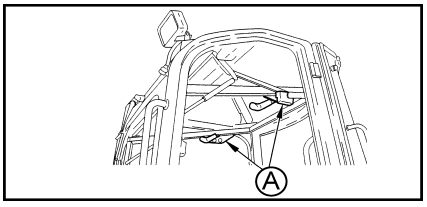
2. Remount the top part of the windscreen and drag it backwards until it positions itself under the ceiling.



3. Lock it is using the safety lock located to the right and left of the ceiling.

A = Safety lock

Closure of the upper part of the windscreen



1. Grasp the handles and push the levers to the right and left of the window until you hear a click for them to unlock.

A = Handle

2. Slowly lower the windscreen holding the handles.

3. Lock it using the safety lock to the right and left of the window.

5.9.3 Lower windscreen

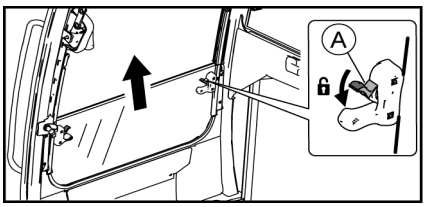
⚠ CAUTION

Place the locking lever(s) in locked position to avoid any unplanned operation of the joysticks when handling the windscreen.

Opening of the lower part of the windscreen

⚠ IMPORTANT

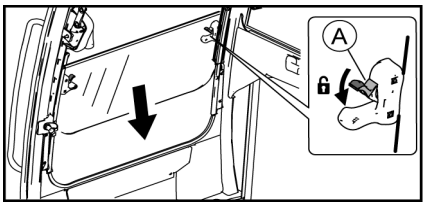
Only open and close the lower windscreen when the upper windscreen is closed.



A = Lever

1. Push the locking levers on the right and left of the lower windscreen down.
2. Lift the lower windscreen.
3. Hold it in place using the locking levers.

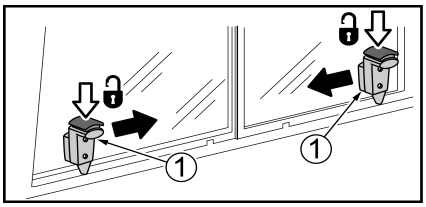
Closure of the lower part of the windscreen



A = Lever

1. Push the locking levers on the right and left of the lower windscreen down.
2. Lower the lower windscreen.
3. Hold it in place using the locking levers.

5.9.4 Right hand cab window



1 = Latch

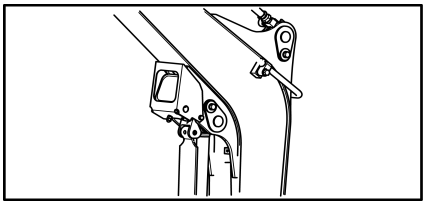
1. Press the latch.
2. Open the right hand cab window by sliding it in the direction indicated by the arrows.

5.10 Headlights

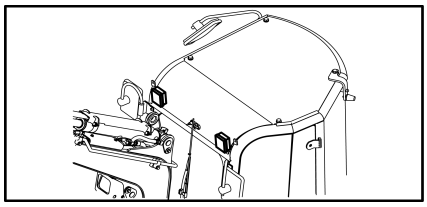
⚠ WARNING

The headlight becomes very hot when it is operating. Never touch it with your bare hands before it has cooled down to avoid any risk of burning.

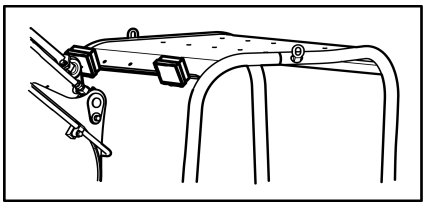
Boom headlamp



Cab headlight *(Options)*



Canopy type *(Options)*



5.11 Fleet management system SMARTASSIST-REMOTE

⚠ CAUTION

Do not use in areas where the use of mobile phones is prohibited (hospitals, airports, mining operation area...).

Do not enter a potentially explosive area with your machine, your box may result in an explosion or fire, resulting in serious physical injury. Hazardous areas are indicated by signage on the work area; observe these to avoid any accidents.

Do not open, repair, disassemble or rebuild the fleet managment system and contact your dealer if it malfunctions.

To operate communication devices, comply with the legal requirements, regulations and conditions of yout country.

Dispose of batteries in an environmentally friendly way.

⚠ DANGER

If you have a Pacemaker, do not carry a mobile phone on your person in a machine fitted with a telemetry control box, to avoid any interference with your medical equipment.

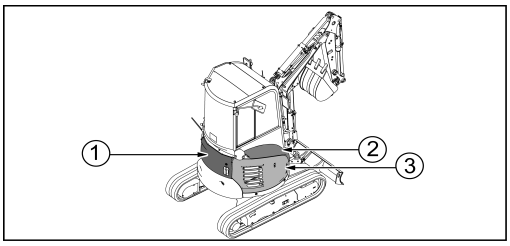
People with a Pacemaker must keep a minimum distance of 22 cm between the Pacemaker and the SMARTASSIST-REMOTE antenna. This minimum distance is guaranteed for all uses and maintenance operations described in this manual.

- The fleet management system makes it possible to know the geographical position of the machines that are equipped.
- Accessing the fleet management system's interface is handled from YANMAR's website or using a smartphone application. Assistance modules and a presentation of the fleet management system's functions are also available from YANMAR's website.
- The telemetry control box is fitted with a GSM modem and a GPS receiver to transmit the data for the fitted machine.

  Note

  Communication may be disturbed in tunnels, buildings or areas with a poor mobile network.
  The fleet management system is connected to the power supply of the machine and is also equipped with its own battery. This allows data exchange even when the machine is switched off.
- For more details, contact your dealer.

6 COVERS



1 = Bonnet
2 = Cover B
3 = Cover R

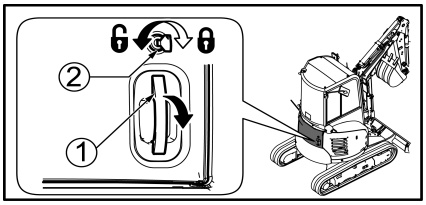
6.1 Bonnet

⚠ WARNING

Do not open the bonnet during machine operation. Verification and topping up of the various levels should be done when the engine is stopped and the temperatures are brought back down.

- Under the bonnet you find:
  - the expansion flask
  - the engine oil gauge
  - the engine oil tank orifice

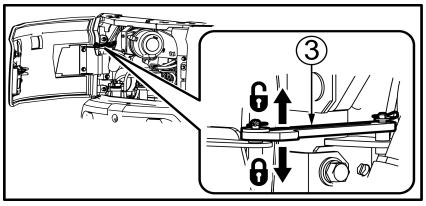
Opening the cover



1 = Handle
2 = Key

1. Insert the starter key into the lock.
2. Turn the key counterclockwise.
3. Pull the handle to unlock the bonnet.
4. Lock the cover using the rod.

Closing the cover



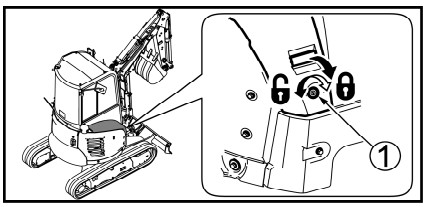
3 = Rod

1. Lift the the rod to release it.
2. Close the cover.
3. Press on it until you hear a click.
4. Turn the key clockwise to activate the lock.

6.2 Cover B

- Under cover B are:
  - the fuel tank
  - the hydraulic oil tank opening cap
  - the battery

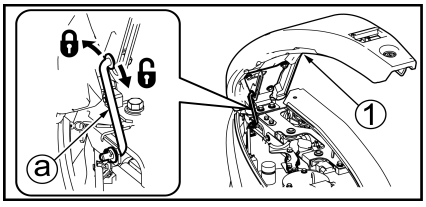
Opening the cover



1 = Key

1. Insert the starter key into the lock.
2. Turn the key counterclockwise.
3. Pull the exterior handle to open the bonnet.
4. Lock the cover using the rod.

Closing the cover



a = Rod

1 = Cover B

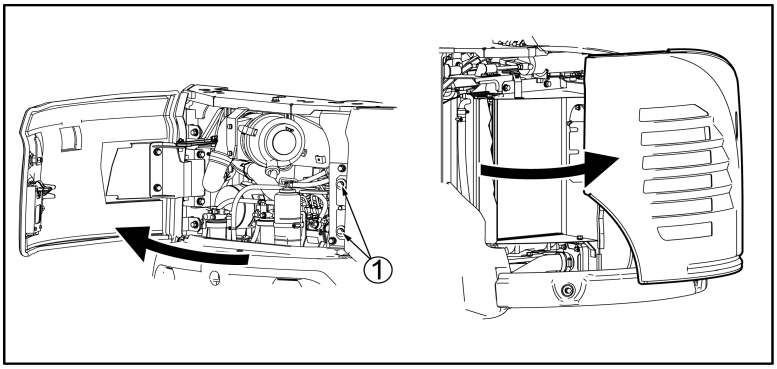
1. Lift the cover slightly and press the rod to release it.
2. Close the cover.
3. Press on it until you hear a click.
4. Turn the key clockwise to activate the lock.

6.3 Cover R

- Under cover R are:
  - radiator

Opening the cover

1. Open the bonnet with the ignition key.
2. Loosen the two screws.



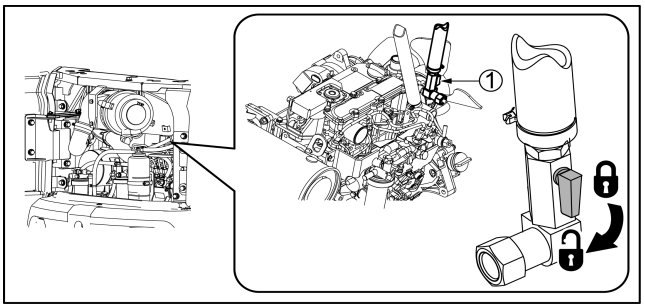
1= screws

7 HEATING VALVE

⚠ WARNING

At operating temperature, the engine components are red hot and may cause burns.

If the operator wishes to ventilate the passenger cabin by stopping the heating function, do the following:



1 = Heating valve

1. Perform the machine's parking operations.
2. Stop the engine by turning the key from ON position to OFF position.
3. Open the bonnet with the ignition key.
4. Turn the valve in the locked position to stop the heating function.
5. Close the engine bonnet.

Note

To restore the heating function reverse the process.

8 OPTIONS

- Mounting options that are not authorised by YANMAR may cause accidents and reduce the machine's life span.
- The installation and use of unauthorised parts may lead to the warranty being cancelled.

8.1 Long arm

- The machine can be fitted when this option is requested.
- Use of hydraulic hammer is not recommended with the long arm.

8.2 Half-circuit

- The machine can be fitted when this option is requested.
- The half-circuit consists of hoses and two two-way valves mounted on the bucket cylinder supply lines.

IMPORTANT

Before using an accessory requiring hydraulic power, check the pressure compatibility from the machine specifications chart.

1 Specifications, page 183

⚠ CAUTION

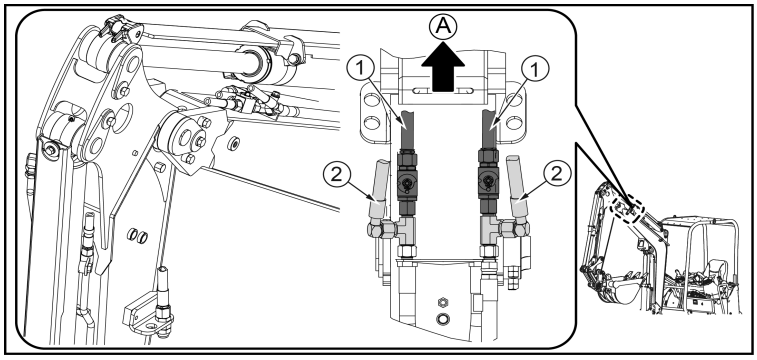
Before any connection or disconnection of the hydraulic hoses, remove the residual pressure from the hydraulic circuit.

1.1.1 Removing the residual pressure, page 145

- Position the valve handles so that the bucket cylinder supply lines are closed and the accessory installed on the machine can be supplied.

Note

Make sure both handles are placed in the same position, so that the bucket cylinder or accessory is properly supplied.



A = Front

1 = Bucket cylinder power supply

2 = Accessory power supply

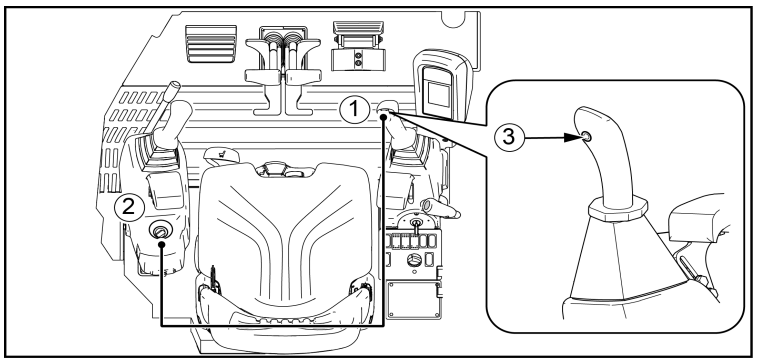
8.3 PTO line 1

- The machine can be fitted when this option is requested.
- For the use of the 3rd circuit, refer to chapter:

13 Implementing the 3rd hydraulic circuit, page 125

Adjustable proportional PTO

- Use the proportional roller to adapt P.T.O. rate.
- The adjustable proportionality allows better P.T.O flow control by combining a knob with the proportional roller.

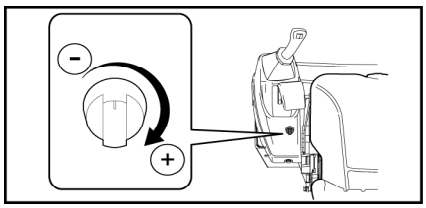


1 = Proportional roller

2 = Knob

3 = Position holding button

- To use the adjustable proportionality system:
  1. Operate the accessory with the proportional roller.
  2. Set the maximum hydraulic circuit speed with the knob.



– Turn the button clockwise to increase the flow rate.

– Turn the button counter-clockwise to decrease the flow rate.

⚠ CAUTION

When starting the machine, check the setting on the knob.

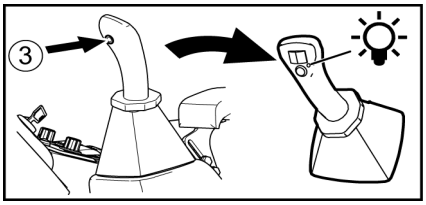
If the knob is set to the minimum, you can not operate the mounted accessory on the PTO line.

Position holding button

⚠ CAUTION

Do not use the position holding with bucket tilting, you would risk damaging the machine's hydraulic circuit.

To use the position holding button:



3 = Position holding button

1. Operate the accessory with the proportional roller.
2. Press the position holding button. Release the proportional roller.

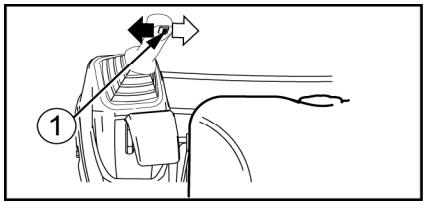
   The proportional roller control pressure is blocked and the LED on the corresponding joystick comes on.
3. The accessory operation is maintained and the accessory is operated at the rate set by the knob.
4. Press the position holding button again to return the pressure to its starting level.

8.4 PTO line 2

- The machine can be fitted when this option is requested.
- For machines with a 4th circuit, this circuit is used with the switch positioned on the left hand command lever.
- PTO 2 may be associated with a knob to make it an adjustable proportional PTO line.

P.T.O. switch

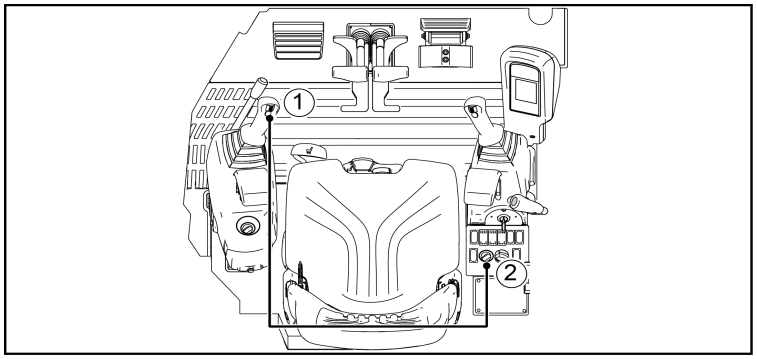
- Use the proportional roller to adapt P.T.O. rate.



1 = Proportional roller

Adjustable proportional PTO

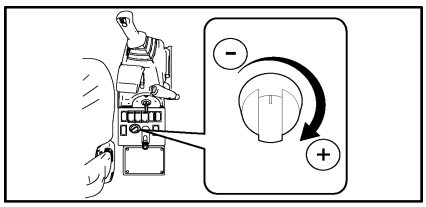
- The adjustable proportionality allows better P.T.O flow control by combining a knob with the proportional roller.



1 = Proportional roller

2 = Knob

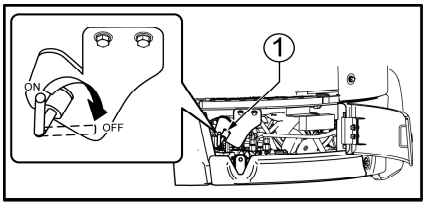
- To use the adjustable proportionality system:
  1. Operate the accessory with the proportional roller.
  2. Set the maximum hydraulic circuit speed with the knob.



– Turn the button clockwise to increase the flow rate.

– Turn the button counter-clockwise to decrease the flow rate.

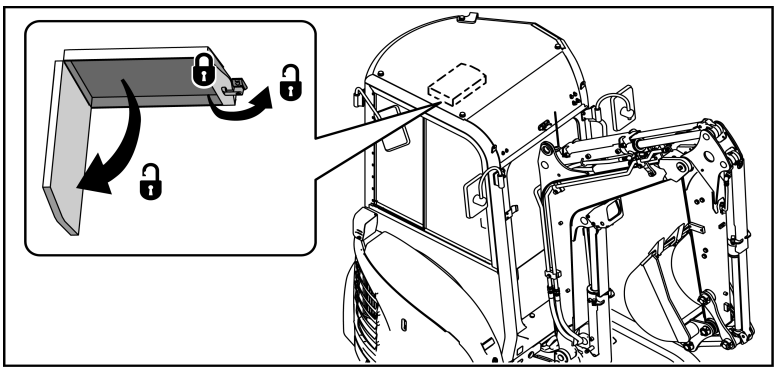
8.5 Circuit breaker



- The machine can be fitted when this option is requested.
- This switch is used to disconnect the battery directly.

1 = Circuit breaker

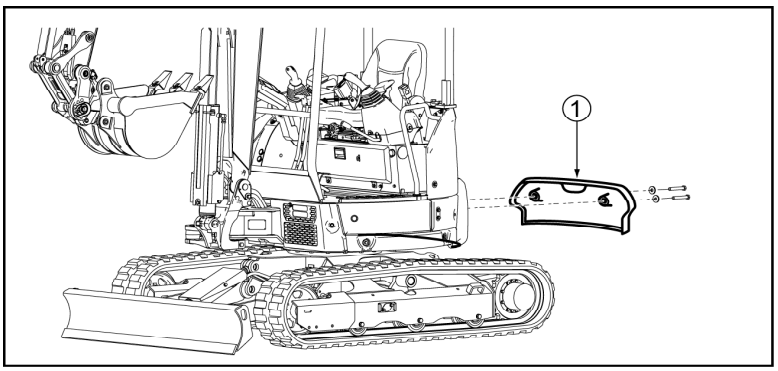
8.6 Document holder



- The machine can be fitted when this option is requested.
- The option consists of:
  - a document box
  - its fasteners

- The location for the user manual is in the document holder below the ceiling.
  - Pull the tab to unlock the box and open it.
  - To close it, push the lid until it locks.

8.7 Additional counterweights



- The machine can be equipped with an additional counterweight that gives it better stability and greater lifting capacities.

1 = Additional counterweights

8.8 Lifting Kit

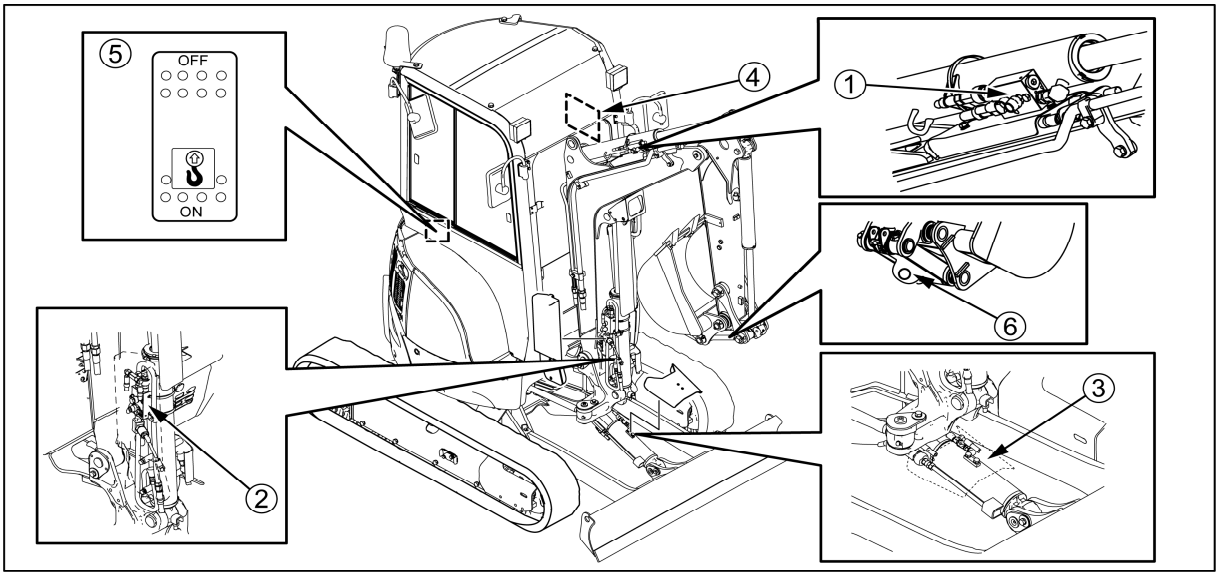
⚠ IMPORTANT

The composition of this kit varies according to machine configuration.

⚠ WARNING

Do not perform lifting operations without the lifting equipment listed below being installed on the machine.

12 Load lifting, page 124



1 = Arm valve
2 = Boom valve
3 = Blade valve
4 = Lifting Tables
5 = Overload switch
6 = Lifting ring

8.8.1 Safety valves

The safety valves must be installed with the ring. These flaps are installed on the machine's boom, rocker arm and blade cylinders to avoid the equipment falling to the ground if the hoses break.

8.8.2 Lifting ring

IMPORTANT

Install a device that can oppose the accidental release of the load on the machine's lifting ring (with latch hook, shackle, eye...) and whose WLL[1] is equal to or greater than the load to be lifted.

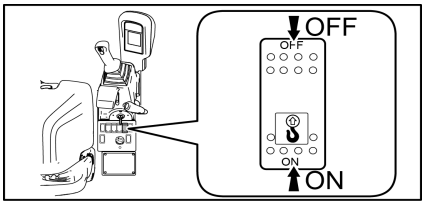
- An appropriate ring is required to suspend a load with the machine. For more details, contact your dealer.
- The lifting ring welded to the bucket link must be installed with safety valves.

IMPORTANT

This kit can be supplied without the bucket link with a lifting ring if the machine is equipped with an accessory that has a lifting device.

- Check whether the ring and the ring mounting base are damaged. If you detect any damage, ask your dealer to intervene.
- This option is subject to periodic inspection.

8.8.3 Overload switch



- When the operator wishes to perform handling, it is essential for the overload switch to be in the ON position, for the purpose of informing the operator of the tipping points according to the load being handled and the position of the equipment.
- An audible signal warns the operator that the load that he is handling is too heavy and could well topple the vehicle.
- When the audible signal sounds, the operator must promptly put the load being handled down on the ground because it could well topple the vehicle.

8.8.4 Lifting Tables

- A table summarizing the machine lifting capacities is provided with the safety valves.

⚠ DANGER

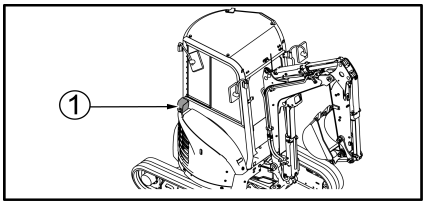
The board must be installed in the cab so as to be visible by the operator from the driver position while operating the machine.

Check it out before doing any load lifting.

F Lifting capacities, page 187

1. Working Load Limit (WLL)

8.9 Travel alarm

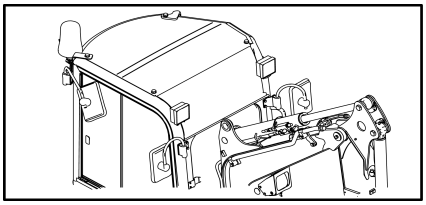


1 = Horn

- The machine can be fitted when this option is requested.
- The travel alarm comprises a pressure sensor and a buzzer.
- When the side movement levers are pushed or pulled, the pressure sensor is activated and the alarm sounds.

8.10 Working headlights

- The machine can be fitted when this option is requested.
- The kit includes two LED lights.



- The headlight direction may be adjusted.
- Press the working headlights switch, the front lights turn on.

5.2.2 Headlight switch , page 23

8.11 Plug-in beacon and rear LED light

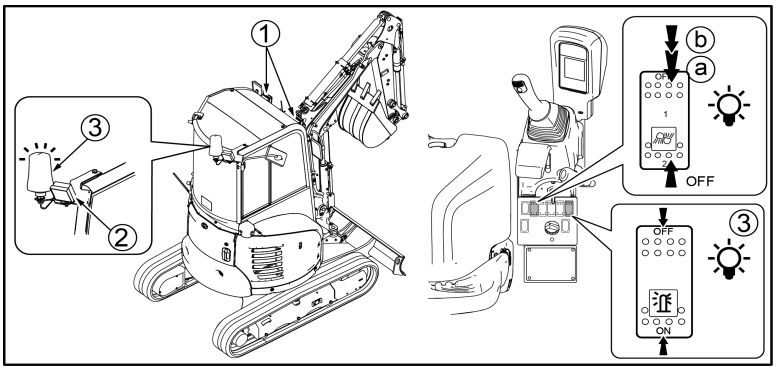
⚠ WARNING

Keep three points of support with the machine to complete the installation safely. If three points of stable support are not available, use suitable equipment to operate the machine safely.

- The machine can be fitted when this option is requested.
- The option consists of:
  - Flashing light
  - Rear light
  - An electrical harness
  - A bracket
  - Beacon switch
  - Rear light switch

⚠ IMPORTANT

The composition of this kit varies according to machine configuration.



1 = Working headlights
2 = Rear light
3 = Flashing light
a = Work lamp
b = Rear light & Work lamp

- To activate the LED light attached to the rear of the cab, turn on the switch located in the cab on the right of the driver's seat.
- To activate the flashing light attached to the rear of the cab, turn on the switch located in the cab on the right of the driver's seat.
- To attach the flashing light:

1. Remove the protective cap from the pin's tip.
2. Insert the tip of the flashing light in the pin and tighten the nut located at the base of the flashing light.

8.12 Fleet management system

- The machine can be fitted when this option is requested.
- The fleet management system is composed of a telemetry control box and an electric harness.
- The fleet management system makes it possible to know the geographical position of the machines that are equipped. The use of the control box's GPS functions involves sending a text message to the GSM number assigned to the machine and provides access to the management services using a web portal (available as a smartphone application).
- The telemetry control box is fitted with a GSM modem and a GPS receiver to transmit the data for the fitted machine. A separate battery supplies power to the telemetry control box when the machine's power supply is cut, thereby giving the fleet management system a certain degree of autonomy.

⚠ CAUTION

Once installed, the telemetry control box cannot be turned off.

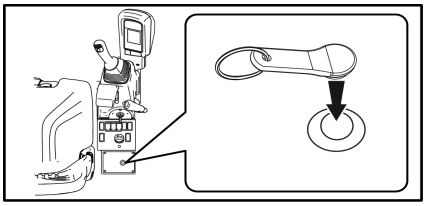
Do not use in areas where the use of mobile phones is prohibited (hospitals, airports, mining operation area...).

Do not enter a potentially explosive area with your machine, your box may result in an explosion or fire, resulting in serious physical injury. Hazardous areas are indicated by signage on the work area; observe these to avoid any accidents.

⚠ DANGER

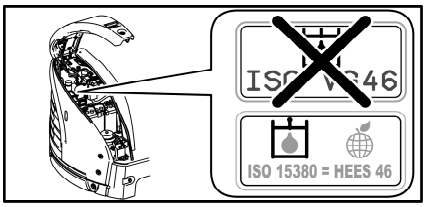
If you have a Pacemaker, do not carry a mobile phone on your person in a machine fitted with a telemetry control box, to avoid any interference with your medical equipment.

- The telemetric device can be coupled on your machine to an immobilizer box and a key reader installed in the cockpit.
- For more information, consult the instructions supplied with the device.



1. Pass the coded key on the key reader in the cockpit.
2. Then turn the starter key within 30 seconds.

8.13 Bio oil



- The machine can be fitted when this option is requested.

⚠ WARNING

When working on your hydraulic system, contact your dealer.

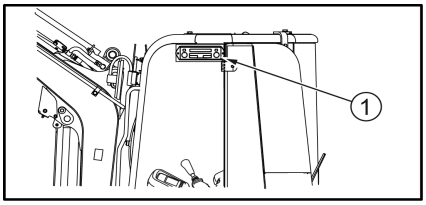
Standard bio oil

The machine can operate with biodegradable hydraulic oil

Panolin bio oil

The machine can operate with biodegradable hydraulic oil (Panolin). The percentage of mineral oil mixed with the bio oil must not exceed 2 %. Refer to the datasheet VDMA 24 569 of March 1994.

8.14 Radio



- The machine can be fitted when this option is requested.
- Refer to the user manual supplied with the radio.

1 = Radio

8.15 Quick connector

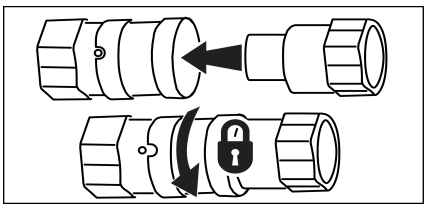
- The machine can be fitted when this option is requested.

⚠ CAUTION

Before any connection or disconnection of the hydraulic hoses, remove the residual pressure from the hydraulic circuit.

1.1.1 Removing the residual pressure, page 145

Connecting



1. Insert the adapter into the receiver.A slight click indicates that the connection is successful. The ball is released from the adapter groove located on the receiver.
2. Turn the adapter on the receiver to secure the connection.

Note

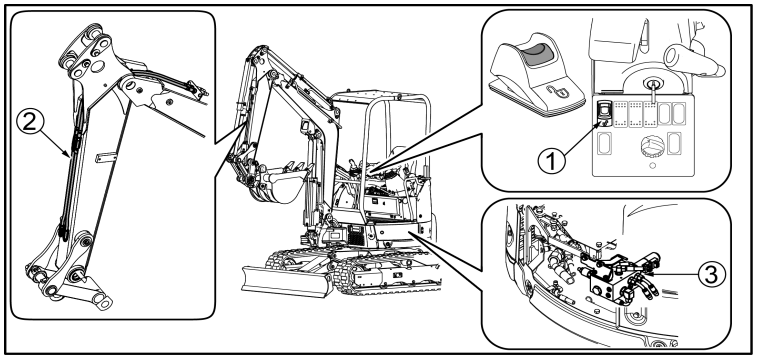
Before each use, clean the receiver surfaces.

Disconnecting

To disconnect, turn the adapter to align the ball with the groove located on the receiver and slide the adapter backwards.

8.16 Continuous pressure hydraulic line

- The machine can be fitted when this option is requested.
- The option is composed of a valve and its bracket, a hydraulic line, and a control switch.



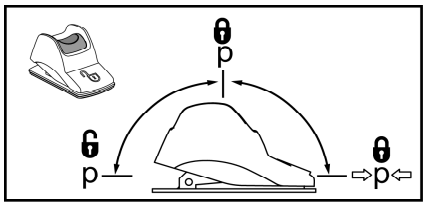
1 = Quick hitch control switch

2 = Hydraulic line

3 = Hydraulic valve

- The hydraulic line is powered by the hydraulic valve which ensures the locking of the accessory by the quick hitch.
- Use the switch located in the cab to install or remove a bucket or an accessory.

8.18 Quick hydraulic hitch L-SYSTEM, page 65



p = Hydraulic circuit pressure

⇨p⇦ = Continuous pressure

Continuous pressure hydraulic line	150 bar

8.17 Mechanical quick hitch

⚠ IMPORTANT

Use YANMAR original parts as recommended in the parts catalogue.

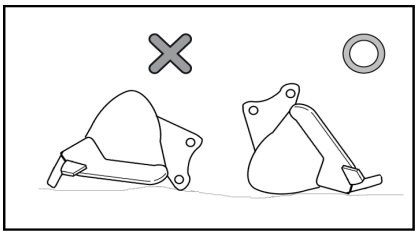
⚠ IMPORTANT

Before using an accessory requiring hydraulic power, check the pressure compatibility from the machine specifications chart.

1 Specifications, page 183

⚠ WARNING

Before mounting a bucket or an accessory on your machine, make sure that:



- **the bucket or accessory is compatible with the capabilities of your machine;**

9.2 Compatible accessories, page 116

- **the bucket or accessory mounting operation is performed on a level and stable ground;**
- **the bucket or accessory is properly positioned to be installed on the machine.**

⚠ WARNING

Check the condition of the interface between the quick hitch and the accessory (cleanliness, shocks...).

It is forbidden to operate the bucket or accessory if improperly locked in quick hitch, because in the case of improper installation it may fall during use.

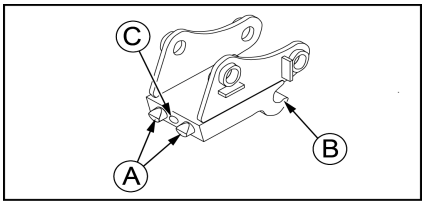
⚠ IMPORTANT

Some quick fasteners have a lifting point. Please refer to the appropriate sections of this manual for the precautions that apply to all lifting operations.

12 Load lifting, page 124

8.17.1 Mechanical quick hitch L-SYSTEM

Quick hitch structure



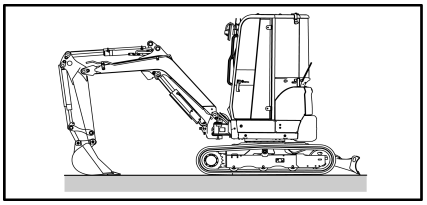
The quick hitch system is composed of:

A = Locking pins

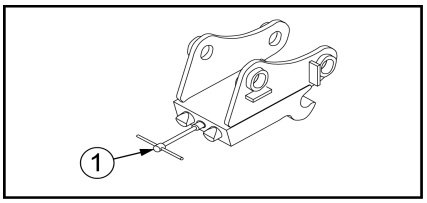
B = Fastening hooks

C = Locking screw

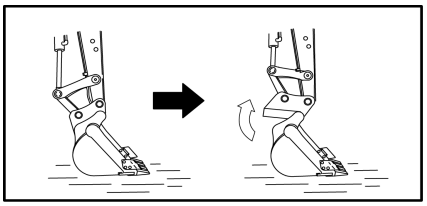
Dismantling the accessory



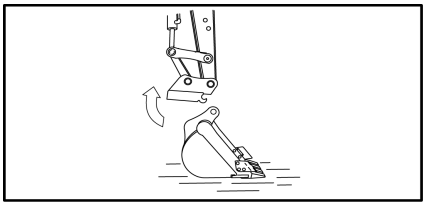
1. Park the machine preferably on a stable, flat and level surface.
2. Place the accessory on the ground.
3. Be equipped with the wrench supplied with the accessory and insert it into the quick hitch hole.



4. Turn the key (1) anti-clockwise to ensure the locking pins click into place.
5. Remove the key and store it.



6. Retract the bucket cylinder to disengage the rear of quick hitch.



7. Slowly remove the boom from the machine to completely free the quick hitch from the bucket or accessory.

Mounting the accessory

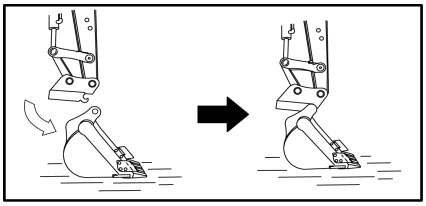
1. Ensure that the accessory is placed on a flat stable surface.
2. Make sure the locking pins are retracted into the quick hitch.

If the pins are in the extended position:

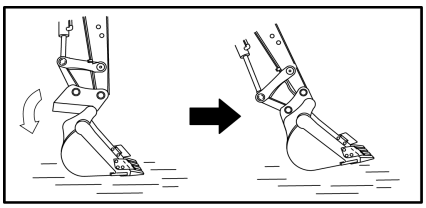
a. Be equipped with the wrench supplied with the accessory and insert it into the quick hitch hole.

b. Turn the key (1) anti-clockwise to ensure the locking pins click into place.

c. Remove the key and store it.



3. Place the arm equipped with the quick hitch on the accessory to engage the accessory hooks on the bucket or accessory pin.



4. Rotate the quick hitch slowly lifting the boom to fully engage the quick hitch to the bucket or accessory.

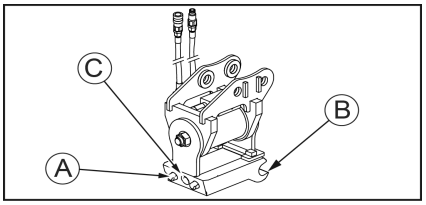
⚠ WARNING

At this stage the accessory is not locked into the quick coupler. Limit the maximum height of this to reduce the consequences in case it falls.

5. Take the wrench supplied with the accessory and insert it into opening in the quick coupler.
6. Turn the key (1) clockwise to ensure the locking pins are completely inserted into the accessory.
7. Remove the key and store it.
8. Manoeuvre the bucket or accessory to low height from the ground to see if it is locked in the quick hitch.

8.17.2 Powertilt using the mechanical quick coupler L-SYSTEM

Quick hitch structure



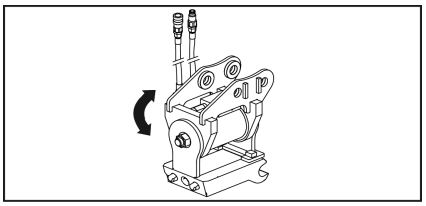
The quick hitch system is composed of:

A = Locking pins

B = Fastening hooks

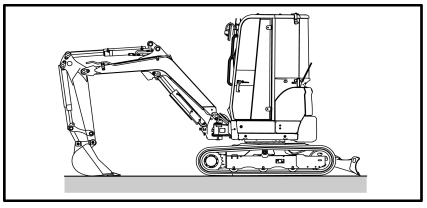
C = Locking screw

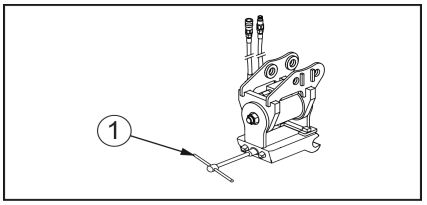
Accessory inclination



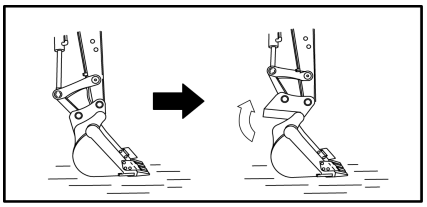
Use the PTO commands to tilt the accessory. The accessory can be tilted to the left or right thanks to the hydraulic motor situated on the quick coupler.

Dismantling the accessory

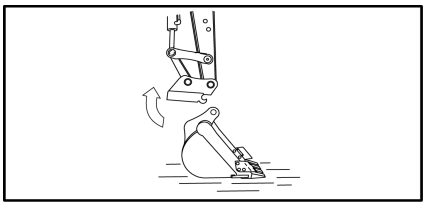




1. Park the machine preferably on a stable, flat and level surface.
2. Place the accessory on the ground.
3. Be equipped with the wrench supplied with the accessory and insert it into the quick hitch hole.
4. Turn the key (1) anti-clockwise to ensure the locking pins click into place.
5. Remove the key and store it.



6. Retract the bucket cylinder to disengage the rear of quick hitch.



7. Slowly remove the boom from the machine to completely free the quick hitch from the bucket or accessory.

Mounting the accessory

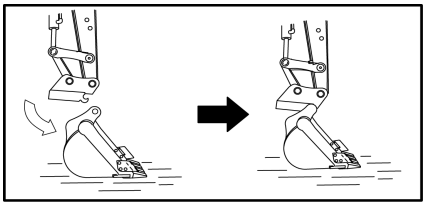
1. Ensure that the accessory is placed on a flat stable surface.
2. Make sure the locking pins are retracted into the quick hitch.

If the pins are in the extended position:

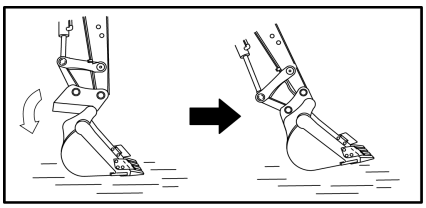
a. Be equipped with the wrench supplied with the accessory and insert it into the quick hitch hole.

b. Turn the key (1) anti-clockwise to ensure the locking pins click into place.

c. Remove the key and store it.



3. Place the arm equipped with the quick hitch on the accessory to engage the accessory hooks on the bucket or accessory pin.



4. Rotate the quick hitch slowly lifting the boom to fully engage the quick hitch to the bucket or accessory.

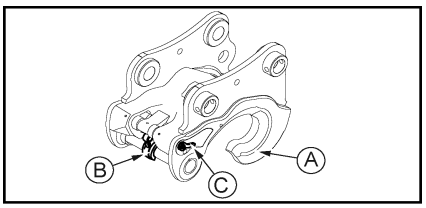
⚠ WARNING

At this stage the accessory is not locked into the quick coupler. Limit the maximum height of this to reduce the consequences in case it falls.

5. Take the wrench supplied with the accessory and insert it into opening in the quick coupler.
6. Turn the key (1) clockwise to ensure the locking pins are completely inserted into the accessory.
7. Remove the key and store it.
8. Manoeuvre the bucket or accessory to low height from the ground to see if it is locked in the quick hitch.

8.17.3 Mechanical quick hitch ACB

Quick hitch structure



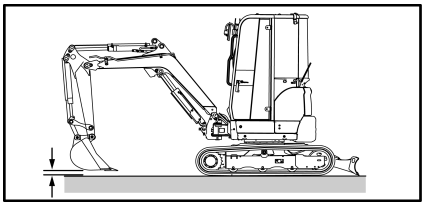
The quick hitch system is composed of:

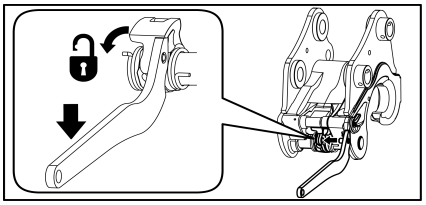
A = Fastening hooks

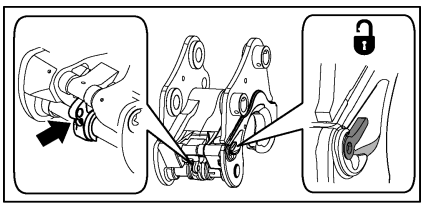
B = Cam

C = Indicator

Dismantling the accessory



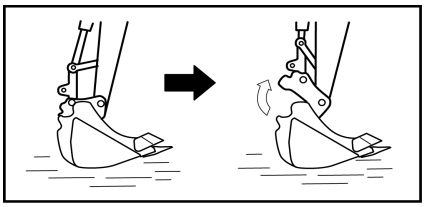




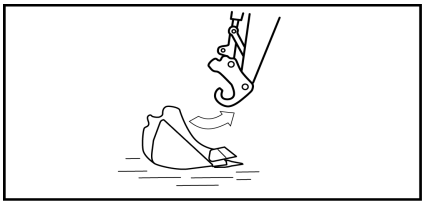
1. Park the machine preferably on a stable, flat and level surface.
2. Place the accessory at about 5 cm above the ground.
3. Be equipped with the wrench supplied with the accessory.
4. Slide the spanner from right to left along the cam to insert the lug of the spanner into the cam bore.
5. Detach the cam, using the spanner as a lever to release the accessory.

⚠ DANGER
By pressing the key, the bucket or accessory detaches and comes into contact with the ground. Take care not to get your hands or feet crushed by the bucket or accessory.

6. The indicator must be in the unlocked position, and the bore of the cam must be visible. If not, repeat the detaching action with the spanner.
7. Remove the key and store it.



8. Retract the bucket cylinder to disengage the rear of quick hitch.



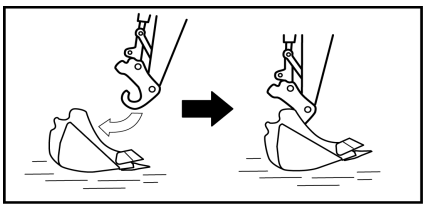
9. Manoeuvre the arm to disengage the tool's quick hitch.

Mounting the accessory

1. Ensure that the accessory is placed on a flat stable surface.
2. Clean all the parts.

   Note

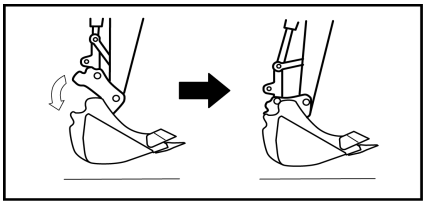
   Check the position of the cam before installing an accessory. The indicator must be in the unlocked position, and the bore of the cam must be visible. If not, repeat the detaching action with the spanner.
3. Fully retract the bucket cylinder.



4. Place the arm equipped with the quick hitch on the accessory to engage the accessory hooks on the bucket or accessory pin.
5. Slowly raise the boom to lift the accessory. This lets you position the accessory correctly in the quick coupler.

   Note

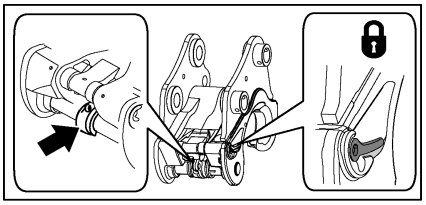
   Lift the accessory high enough to allow the bucket cylinder to move through its full range of travel.



6. Extend the bucket cylinder fully to lock the quick coupler system.

   Note

   You should hear a click when the quick coupler system locks.



7. Check that the indicator is in the locked position.

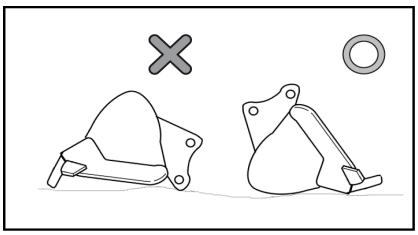
   Note

   The painted indicator area must be hidden by the indicator.
8. Manoeuvre the bucket or accessory to low height from the ground to see if it is locked in the quick hitch.

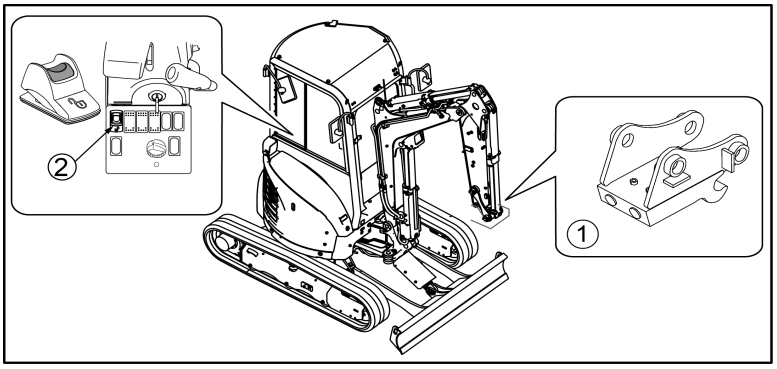
8.18 Quick hydraulic hitch L-SYSTEM

⚠ WARNING

Before mounting a bucket or an accessory on your machine, make sure that:



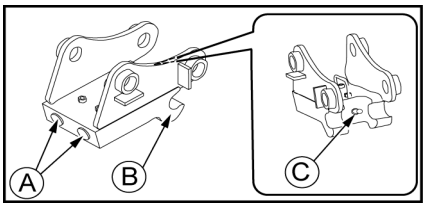
- **the bucket or accessory is compatible with the capabilities of your machine;**
- **the bucket or accessory mounting operation is performed on a level and stable ground;**
- **the bucket or accessory is properly positioned to be installed on the machine.**



1 = Quick hydraulic hitch
2 = Quick hitch control switch

Quick hydraulic hitch

- When the locking pins retract, a indicator pin is visible in the quick hitch.
- When the locking pins are removed, the indicator pin retracts and is no longer visible.



A = Locking pins
B = Fastening hooks
C = Indicator pin

Quick hitch control switch

- Use the switch located in the cab to install or remove a bucket or an accessory.
- **OFF**

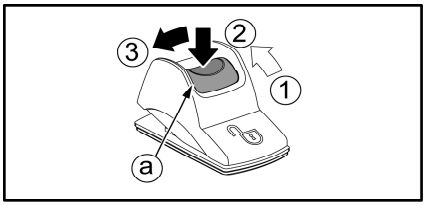
The pressure in the machine's hydraulic system guarantees the locking of the quick coupling.

- **Locked position**

The pressure in the machine's hydraulic system locks the quick coupling.

- **Unlocked position**

Press the interlock on the switch to flip the control switch from the neutral position to the unlocked position. The pressure in the machine's hydraulic system unlocks the quick coupling.



a = Safety

1 = OFF

2 = Locked position

3 = Unlocked position

Note

Due to a regulatory change, the control may be accompanied with the function described below:

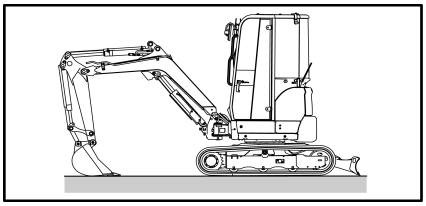
When turning the starter key to "ON", the switch LED lights up.After a short period, the audible alarm of the hydraulic quick coupler sounds for a few seconds.

In the event of a fault on the audible alarm of the hydraulic quick coupler, the switch is deactivated and the LED flashes.

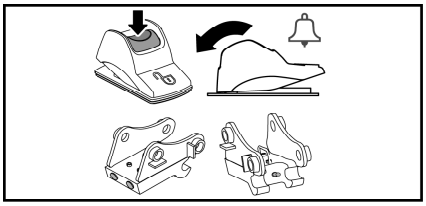
⚠ IMPORTANT

If an element is not working or you think it is defective, shut down the machine's engine immediately and contact your dealer.

8.18.1 Dismantling the accessory

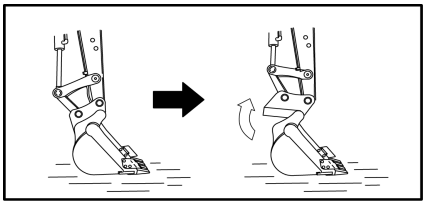


1. Park the machine on flat, firm ground.
2. Place the accessory on the ground.

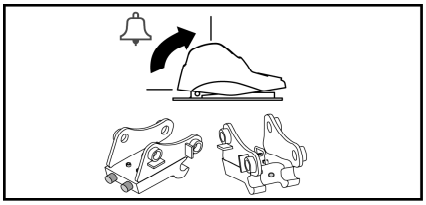


3. Press the interlock on the switch to set it to the unlocked position, and wait for the locking pins to be fully retracted.

The control rod (C) is visible. The alarm sounds.



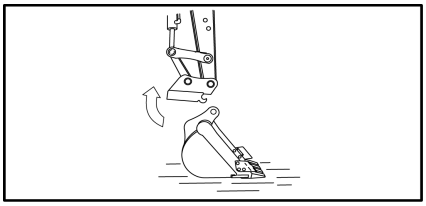
4. Slightly raise the boom to partially release the accessory by pivoting its shaft around the hook of the quick coupling.



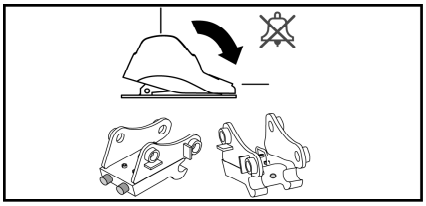
5. Set the switch to the locked position and wait until the locking pins are fully out.

The control rod is not visible. The alarm sounds.

⚠ WARNING
Do not perform this step if the control rod is visible. Handling the quick coupling in the bucket or the accessory brings a risk of damaging the indicator pin.



6. Take the boom to disengage the accessory hooks on the bucket pin or accessory.



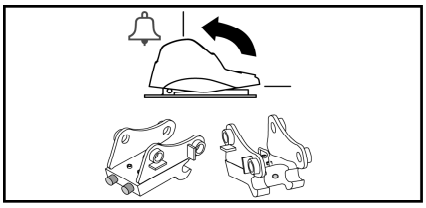
7. Set the quick coupler switch to the OFF position.

The control rod is not visible. The alarm stops.

8. Move the quick hitch away from the accessory.

8.18.2 Mounting the accessory

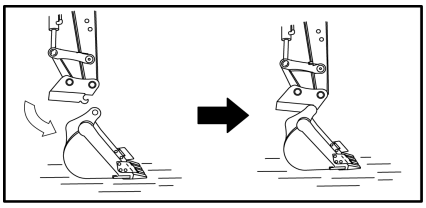
1. Ensure that the accessory is placed on a flat stable surface.



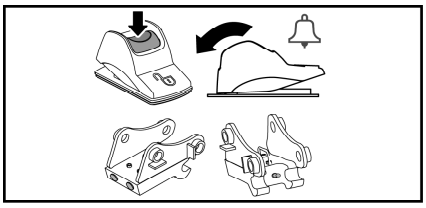
2. Set the switch to the locked position and wait until the locking pins are fully out.

The control rod is not visible. The alarm sounds.

⚠ WARNING
Do not perform this step if the control rod is visible. You might damage the control rod engaging the quick hitch to the bucket or accessory.



3. Place the arm equipped with the quick hitch on the accessory to engage the accessory hooks on the bucket or accessory pin.

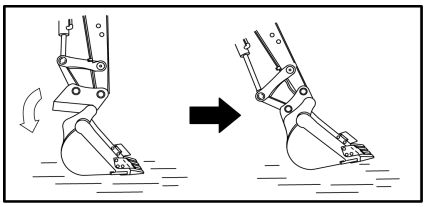


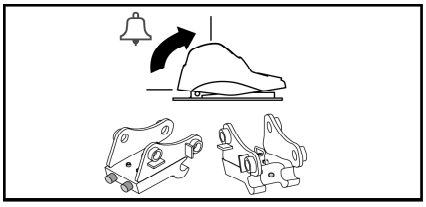
4. Press the interlock on the switch to set it to the unlocked position, and wait for the locking pins to be fully retracted.

The control rod (C) is visible. The alarm sounds.

5. Rotate the quick hitch slowly lifting the boom to fully engage the quick hitch to the bucket or accessory.

The control rod must be visible from the driving position.





6. Set the switch to the locked position and wait until the locking pins are fully out.

Note

The locking pins engage on the bucket or accessory to lock it.

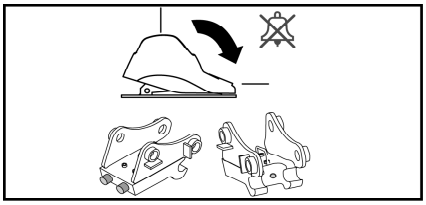
The control rod is not visible. The alarm sounds.

⚠ DANGER

Make sure that the control rod is retracted into the quick hitch and is no longer visible. Otherwise check the condition of the interface between the quick hitch and the accessory (cleanliness, shock...).

It is forbidden to operate the bucket or the accessory if the control rod is still visible, because in this case it is not installed on the machine and it may drop during use.

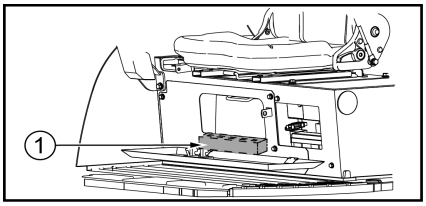
7. Manoeuvre the bucket or accessory to low height from the ground to see if it is locked in the quick hitch.



8. Set the quick coupler switch to the OFF position to lock the quick coupler.

The control rod is not visible. The alarm stops.

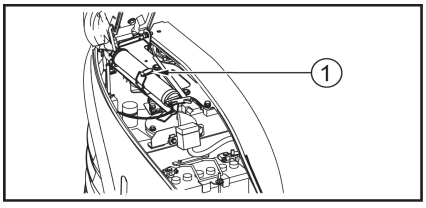
8.19 Quick coupler key housing



1 = Quick coupler key housing

- The machine can be fitted when this option is requested.
- This housing is where the quick coupler key is stored. The housing may be of a different type depending on the quick coupler.

8.20 Grease pump housing



1 = Grease pump housing

- The machine can be fitted when this option is requested.
- The grease pump can be lodged in the housing provided.

B Operating instructions

Chapter covered in this part:

1 Basic precautions

⚠ CAUTION

The user must determine whether dangerous phenomena may occur in an application, for example, the release of toxic gases, or whether the ground conditions require specific precautions. The user establish the measures to be taken to eliminate or reduce the risks.

1.1 Comply with your workplace's safety rules

- This machine must only be used and maintained by qualified personnel.
- When using or maintaining the machine, comply with all safety rules, precautions and procedures at all times.
- Any task performed in teams or with a flagman should be performed based on regulatory signals.

⚠ DANGER

The machines are not designed to work in explosive or polluted environments.

The machine configuration cannot guarantee the safety of the operator in a harmful environment. The machine must therefore not be used in such environments.

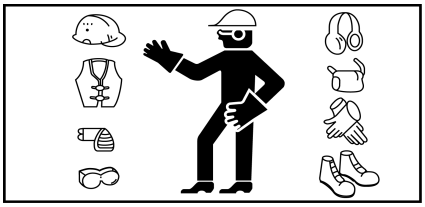
1.2 Put the safety mechanisms in place

- Make sure that all covers and all housings are properly installed in their respective positions. If any of them are damaged, repair them immediately.
- The use of safety mechanisms, such as locking lever(s) must be mastered and understood by the machine's operator.

5.3.1 Locking lever , page 27

- Never remove the safety mechanisms. Check that they are operating correctly at all times. If the safety mechanisms are operating incorrectly this may cause serious physical injury.

1.3 Wear suitable clothing and protective equipment

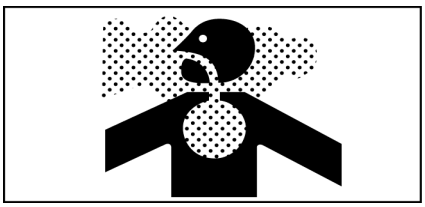


- Never wear bulky clothing or jewellery that may be caught in the control levers or a part of the machine. Also avoid wearing soiled work clothes, which can be risky when using the machine.
- Wear a helmet, protective goggles, safety shoes, a mask, gloves and any other protective equipment necessary to suit the working conditions.

1.4 Do not drive under the influence of alcohol, drugs or medication

- Never use the machine if you are under the influence of alcohol, if you are ill or if you do not feel well as this may cause an accident.

1.5 Provide adequate ventilation when working in an enclosed space



- The engine exhaust fumes are harmful to the human body and it is very dangerous to inhale them. When you start the engine in an enclosed space, open the windows and doors to let air circulate.
- Never let the engine idle unnecessarily and never leave the engine running when you are not using the machine.
- Provide respirators based on working conditions to ensure the machine operator works safely.

1.6 Protect plants from hot air and exhaust fumes

- The silencer and radiator release hot air and exhaust fumes at high temperatures. If the hot air directly reaches a plant, it alters its state and may cause its death.
- Protect plants from hot air and exhaust fumes with a protective plate when you are working near a hedge or plants.

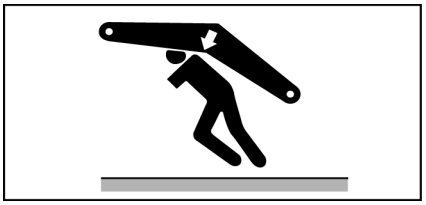
1.7 Keep fuel and oil away from sparks

- Leaving flames near fuel, oil, hydraulic oil or anti-freeze solutions, which are highly flammable and dangerous, may cause a fire.
- Specific attention must be paid to the following points :
  - Keep flammable materials away from cigarettes, lit matches or any source of fire.
  - Never top up any fluids while the engine is running. Do not smoke when topping up any fluids.
  - Tighten the fuel and oil tank caps firmly.
- Store fuel and oil in a cool, well-ventilated place away from direct sunlight.
- The fuel and oil must be stored in a place that responds to applicable safety regulations. Unauthorised personnel must not enter this area.

1.8 Avoid removing the caps when the temperatures are high

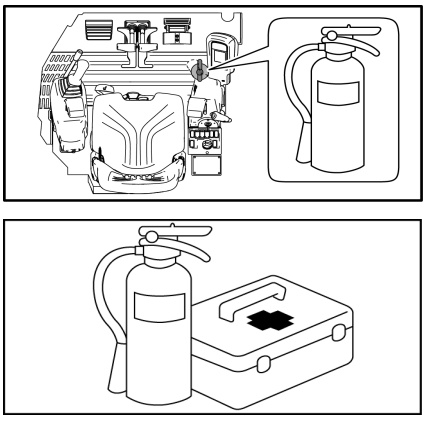
- The engine coolant, engine oil and hydraulic oil are hot and pressurised after the engine stops.
- Removing caps, draining coolant or oil or replacing a filter under these conditions risk causing burns.
- Before you remove the cap from the hydraulic oil tank, shut down the engine then gently turn the cap to release all the pressure and avoid any oil spilling.
- When you remove the radiator cap, shut down the engine and let the coolant cool down enough then gently turn the cap to release all the pressure.

1.9 Avoid crush injuries due to accessories



- Keep your hands, arms and other parts of your body away from moving parts, between the machine's accessories or between the hydraulic cylinder and the accessories as jamming points may be created.

1.10 Have an extinguisher and a first aid kit



- The workplace must be equipped with an extinguisher. Read the instructions on the adhesive labels to find out how to use it.
- Place a first aid kit in a specific location.
- Specify the action to be carried out in the event of a fire or accident.
- Indicate the person to be contacted in the event of an emergency and leave the emergency call number near your telephone.
- A location to install an extinguisher is provided inside the machine's cab.

1.11 Avoid any unauthorised modifications

- Any unauthorised modification to the design or use of unauthorised accessories may cause physical damage. YANMAR cannot be held responsible for any physical injuries, accidents, failure or damage to the machine due to any unauthorised modifications.
- In addition, in that these actions would constitute an explicit violation of the terms of the YANMAR Product Warranty, the applicable warranty would also become null and void.If you want to modify your machine, you must contact your dealer.

1.12 Precautions for optional parts and tools

- Any modifications that are not approved by YANMAR may cause safety risks.
- If the equipment you want to add to your machine is not listed by YANMAR, you must contact your dealer. YANMAR cannot be held responsible for any physical injuries, accidents, failure or damage to the machine due to any unauthorised modifications. Any unauthorised modification will lead to the YANMAR warranty being cancelled.
- When you install or use optional accessories, read their operating instructions and the section in the manual that relates to the installation of accessories

11 Accessory change by direct coupling, page 121

- Only use accessories authorised by YANMAR. The use of unauthorised accessories not only risks affecting the safety of the machine but also its operation or life span.
- The use of unauthorised equipment will contravene the terms of the YANMAR warranty and cancel it.

1.13 Warning concerning the cab windows

- If, by accident, a cab window is broken, the sharp edges may represent a danger to the operator. Stop the machine immediately and replace the broken window with a new one.

1.14 Cabin's emergency exit

1. Raise the locking lever(s).

⚠ WARNING
When you leave the operator seat in case of emergency, always set the locking lever (s) to the locked position. Otherwise, untimely handling of the control levers may lead to severe injury.

2. If the cab door can be opened, open it to exit the machine.

3. If the cab door will not open, break the glass with the hammer provided in the cab to be able to exit the cab in an emergency.

Note

The emergency exit is indicated by a safety sticker.

⚠ WARNING
Remove the pieces of glass that remain in the window frame to avoid any cutting risk.

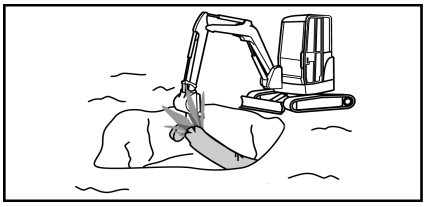
Make sure that you do not slip on the pieces of glass that have fallen at your feet on the cab floor.

4. Do not return inside the machine as long as the issue having triggered emergency evacuation has been identified and corrected.

2 USAGE PRECAUTIONS

2.1 Precautions before using the machine

2.1.1 Make sure that your workplace is safe



- Before you start the engine, make sure that there is no danger in your working area.

If there are any underground installations such as water or gas pipes, high voltage lines or other elements, contact the responsible companies to locate them exactly and to avoid damaging them.

- Examine the field and the ground and decide on the best way to work.
- When working on the street, make sure the worksite is secure.
- Be aware of the position and the work undertaken by other machines present at the place of work.
- Do not work near a fire.
- Do not start the machine near flammable products.
- If you have to use the machine under specific conditions (water, snow, etc.)

2.3.7 Working in an area covered with snow, page 90

2.3.10 Working in a submerged area, page 91

2.3.11 Working in a muddy area, page 92

2.1.2 Clean the machine

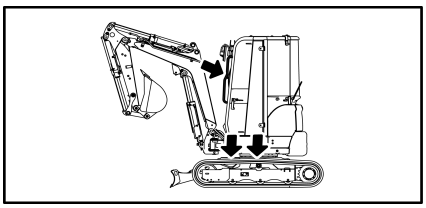
Cleaning

- Wood chips, dead leaves, detritus and other flammable materials around the engine may catch fire. Clean these materials from the machine.

- Dirt, oil and snow on the cab floor, the levers, handles or steps are slippy and dangerous. Clean them completely.
- Proceed to the checks:

3 Checks before starting the machine, page 96

Keep the headlights and mirrors clean



- To clean the cab exterior:
  - Be sure to keep three points of support with the machine when cleaning the external elements (e.g. mirrors).
  - Use the support points identified in the illustration opposite.
  - If 3 points of stable support are not accessible for cleaning or maintenance of the external elements, use adapted equipment in order to safely work on the machine.

- Check that your machine is fitted with headlights and specific working lamps and that they are working correctly.
- If your machine is equipped with a camera and a screen, clean them in order to work with the machine in complete safety.

2.1.3 Check the safety structures

⚠ WARNING

If one of the safety structures is damaged, replace it immediately to avoid any injury. Do not repair or modify it.

- The standard machine is equipped with a Falling Objects Protection Structure (FOPS) on the machine's roof.
- For your safety, the machine includes a protection structure in the event of it turning over (ROPS), for protection against falling objects (FOPS) and protection against side tipping (TOPS). Never modify any of these structures' elements.
- The protection structures mounted on the machine comply with the recommendations of:
  - **ROPS:** ISO 12117–2 (2008)
  - **FOPS:** ISO 10262 (2000)

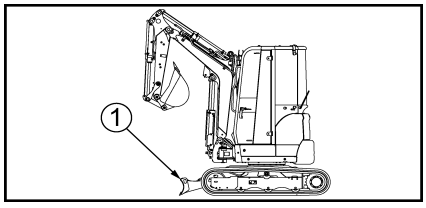
For the specifications of these structures, refer to the table below:

Type	ROPS / TOPS
Weight (in conformity with CE standards)	3100 kg

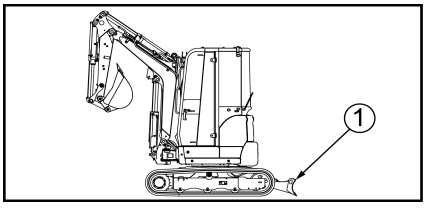
2.1.4 Check the position of the blade

- Check the position of the blade before operating the side movement levers. When the blade is at the back, the operation of the side movement levers is reversed.

Normal travel



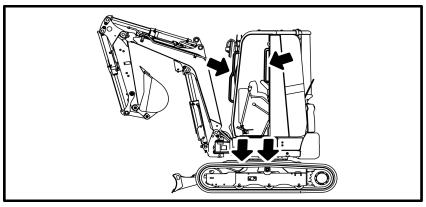
Reverse slide movement



1 = Blade

2.1.5 Accessing the machine

- Do not jump on or out of the machine. Do not climb into or out of the machine when it is operating as this may cause physical injuries.
- When you enter and leave the machine, face the machine and use the handles and the top of the track.



- Use the contact points indicated by arrows in the illustration opposite to climb onto and descend from the machine.
- Do not use the command levers as handles.
- Always maintain three points of contact.
- If the handles or the track is dirty or covered with oil, wash them off.

⚠ CAUTION

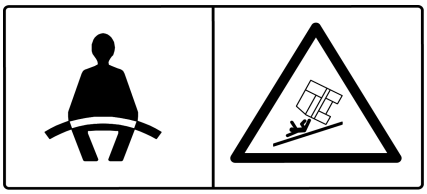
Make sure that you do not bang your head against the rearview mirror when you climb into or out of the cab.

2.1.6 Fasten your safety belt and adjust the rearview mirror(s)

⚠ WARNING

The seat belt must be replaced after an accident or if it is damaged.

Any damaged rear-view mirror must be changed immediately.



- The operator's seat is fitted with a safety belt.
- Always fasten your safety belt and adjust it before starting the machine.
- The seat and its support must be checked by your dealer after an accident.
- If the seat and/or its support are damaged they must be replaced immediately.
- Adjust the rearview mirror(s) so that you have perfect visibility around the machine.

2.1.7 Precautions before starting the engine

- Do not start the machine if a label indicating that a maintenance operation is in progress is present on the machine or on the control levers.
- Place the control lever in the neutral position.

2.1.8 Precautions during the break-in period

- It is vital that you respect a running in period for the machine during the first hundred hours of service (read the time counter). During this period, the machine must not be used with an excessive load, even though it has been correctly prepared and checked before despatch. Otherwise there is a risk that its performance will be affected and its life span shortened.
- When running in the machine, make sure to :
  - Preheat the engine by running it on idle for 5 minutes after starting it.
  - Do not run the machine with a heavy load or at a high speed.
  - Do not start, accelerate or stop the engine suddenly.
  - Do not change direction too suddenly.

Note

Observe these precautions throughout the life of the machine in order to preserve the good condition of the engine.

2.2 Movement precautions

2.2.1 Machine's Danger Zone

⚠ DANGER

The operator must manipulate the machine controls from the operator seat. Any use of the machine controls from the ground is strictly prohibited because it can lead to physical injury.

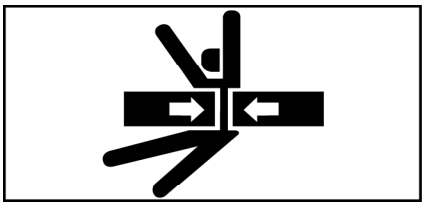
⚠ WARNING

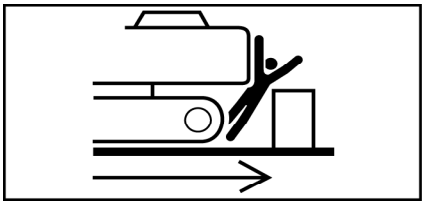
Start the engine and run the machine only from the operator seat.

⚠ DANGER

If a person is in the machine's danger zone, it may be struck by the machine's moving parts or be wedged between the machine's lower and upper parts, which can result in serious injury or death.

The field of vision from the machine is limited when looking backwards. Ensure nobody is located behind the machine before reversing.



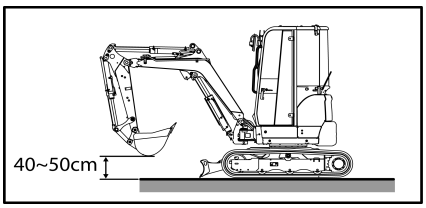


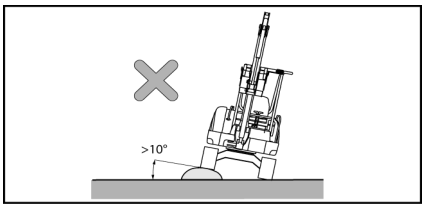
- A signaller must be provided when the working site is dangerous or has poor visibility.
- Keep all other people away from the working site or movement route of the machine.
- Keep any other persons out of the danger zone represented by the equipment's operating radius.

Equipment operating range = 5 m

- Alert people nearby using the horn or any other signal before starting the machine.

2.2.2 Movement and accessories





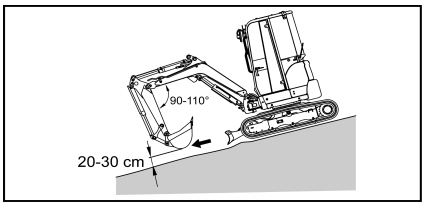
- When moving the machine, keep the bucket between 40 and 50 cm above the ground with the boom and arm folded .
- If you need to use the command levers when moving, do not make any sudden movements when operating them.
- Move the machine at low speed and slow down when turning on hilly terrain.
- Avoid driving over obstacles if possible. Avoid them or remove them. If this is not possible, drive the machine at low speed keeping the tool near the ground. Never travel over obstacles that risk tilting the machine by over 10 degrees.

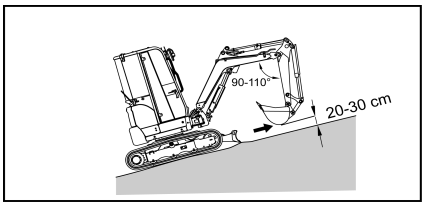
2.2.3 Driving the machine on a slope

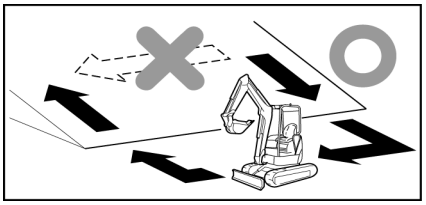
⚠ WARNING

The machine may lose its balance and tip over when rotating the upper part or when the equipment is working on a slope.

Do not pivot the upper structure with a load in the bucket. If the rotation cannot be avoided, provide a bank to keep the machine as horizontal as possible. Then turn the upper structure.







⚠ WARNING

Never travel across a slope of 20° or more as the machine may tip over.

- Drive the machine carefully on a slope to avoid any tipping over or slipping to the side.
- When driving the machine on a slope, keep the bucket between 20 and 30 cm above the ground to be able to lower it to the ground and stop the machine in the event of an emergency.
- Never turn the machine on a slope and do not move it across a slope. Descend to flat ground and then turn.

Note

For the maximum acceptable slope:

1 Specifications, page 183

- The machine will slide easily on grass, dead leaves or a damp metal plate, even with a slight tilt. Drive the machine carefully at low speed to prevent it slipping.

Braking when descending on a slope

- When going downhill, you can automatically stop the machine by putting the travel levers in neutral.

If the engine stops

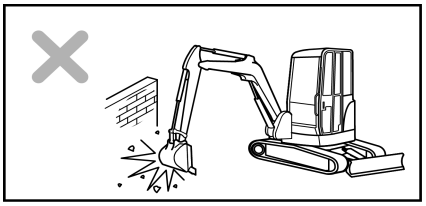
- If the engine stops when climbing an incline, position the travel levers in the neutral position and lift the locking lever, then stop the machine and restart the engine. If the machine does not start, pull the locking lever and check the fuel level.

2.3 Working precautions

2.3.1 Precautions for using the equipment

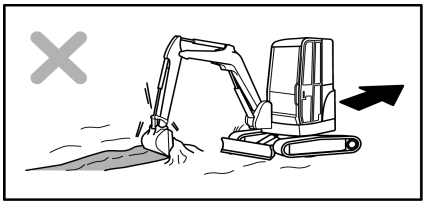
⚠ WARNING

Do not use the equipment's command levers during side movement. Stop the side movement then use the equipment.



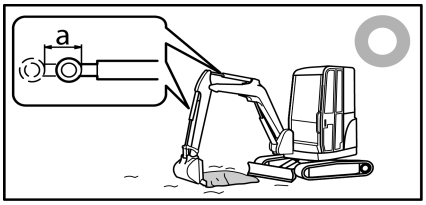
- **Do not use the equipment's rotation force.**

Do not use the rotation force to level the ground or break a wall. Do not use the bucket's teeth to dig the ground during rotation. This may damage the equipment.



- **Do not use the equipment's side movement force (except where unavoidable).**

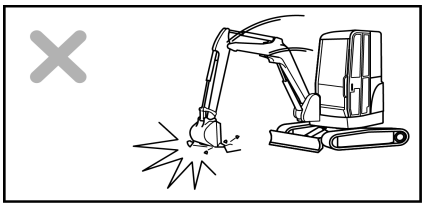
Do not use the side movement force to dig the ground with the bucket's teeth in contact with the ground. This may apply excessive force to the rear of the machine and shorten its life span.



- **Do not use the hydraulic cylinder to the end of its run.**

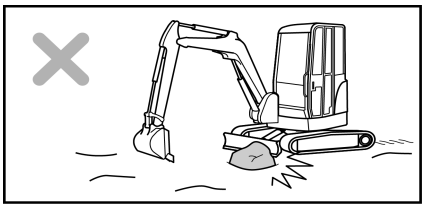
a = play

This may apply excessive force to the cylinder's stop piece and may reduce the equipment's life span. Maintain safe room for manoeuvre.



- **Do not use the bucket's dropping force.**

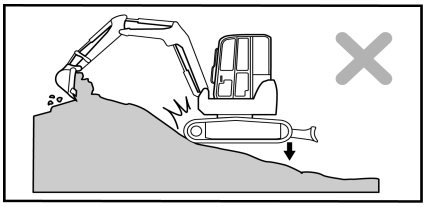
Do not use the bucket's dropping force to dig the ground as with a pick or harvester. This may apply excessive force to the rear of the machine and shorten its life span. In addition, this may cause a serious accident.



- **Do not strike the blade against a rock or stone.**

This may damage the blade or hydraulic cylinder.

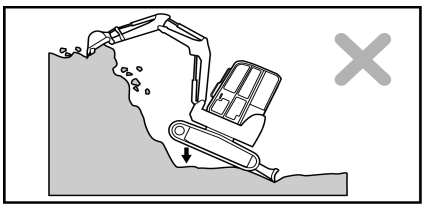
2 Usage precautions



- **Do not use the machine's lowering force.**

  Note

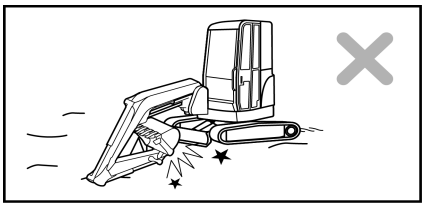
  Do not use the machine's lowering force to dig the ground.



- **When excavating a hard rock, keep the machine's tracks flat on the ground.**

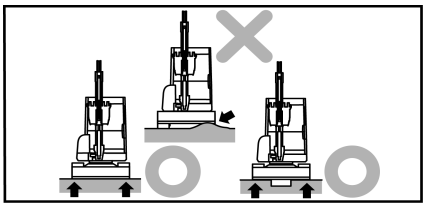
  Note

  It is also recommended to break hard rock into several pieces using other means to prevent damage to the machine.



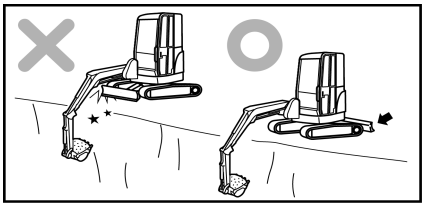
- **Be careful when pulling the equipment out.**

When you retract the equipment for side movement and transport, make sure that the bucket and blade do not come into contact.



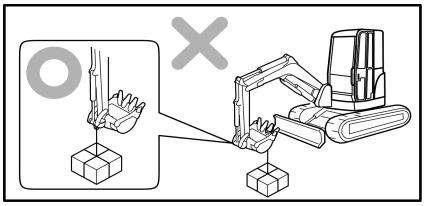
- **Support the blade on both sides.**

When you use the blade as a support, press the blade down on both sides.



- **Pay attention to the blade during excavation.**

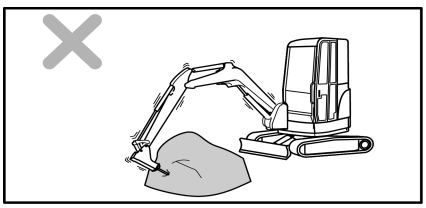
When carrying out a deep excavation on the ground in front of the blade, make sure that the blade does not come into contact with the boom cylinder. Place the blade at the back if it is not in use.



- **Do not lift loads without a suitable fastening device; it is strictly forbidden to wrap a sling around your machine's accessory or suspend it to a bucket tooth.**

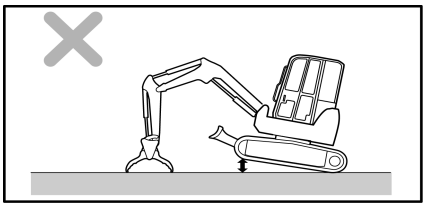
  Do not hang a load without the kit's lifting facilities.

8.8 Lifting Kit, page 50



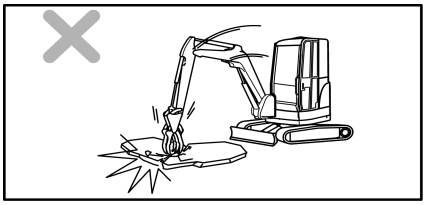
- **Do not operate the attachment with any hydraulic cylinder at the end of stroke.**

Do not operate the attachment with any hydraulic cylinder fully extended or retracted (i.e. at the end of stroke). Doing so may apply excessive load to the hydraulic cylinder, resulting in damage to the hydraulic cylinder or oil leaks.



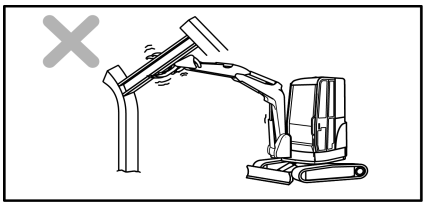
- **Do not raise the machine using the attachment mounted on the implement.**

Do not turn or raise the machine by pressing the attachment against the ground. Doing so may result in an accident or damage to the machine.



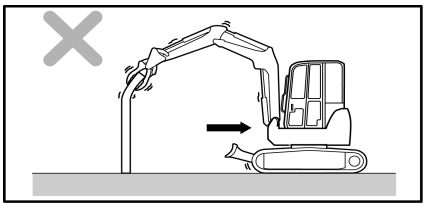
- **Do not strike an object with the attachment mounted on the implement by operating the implement.**

Do not attempt to break an object by striking it or applying pressure to it with the attachment. Doing so may result in damage not only to the attachment, but also to the machine.



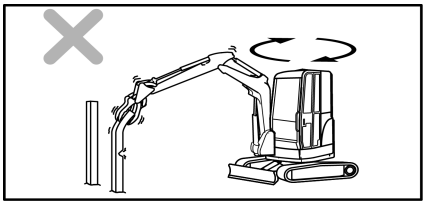
- **Do not grab an object with the attachment mounted on the implement at an oblique angle to the object.**

Grabbing an object with the attachment oblique to the object is prohibited since doing so may result not only in reduced work efficiency, but also in damage to the machine.



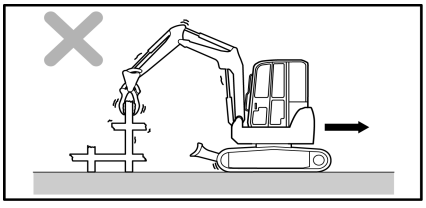
- **Do not twist, pull or drag an object by grabbing it using the attachment mounted on the implement.**

Twisting, pulling or dragging an object forcibly with the object held by the attachment is prohibited since doing so may result in damage to the attachment or the machine.



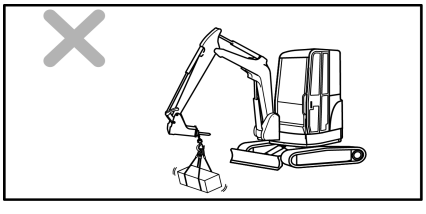
- **Do not turn the upperstructure with an object held by the attachment mounted on the implement.**

Turning the upperstructure with an object held by the attachment is prohibited since doing so may result in an accident or damage to the attachment or the machine.



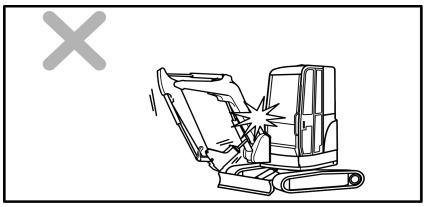
- **Do not run the machine with an object held by the attachment mounted on the implement.**

Running the machine with an object held by the attachment is prohibited since doing so may result in an accident or damage to the attachment or the machine.



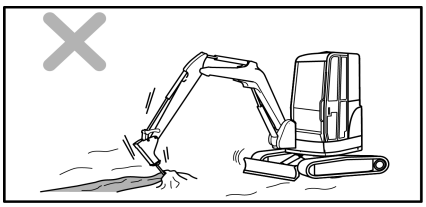
- **Do not lift a load using the attachment mounted on the implement.**

Never lift a load with the attachment using lifting means such as wire ropes since doing so falls outside the scope of the intended use of the machine and can be dangerous.



- **Be careful that the attachment does not come into contact with other parts.**

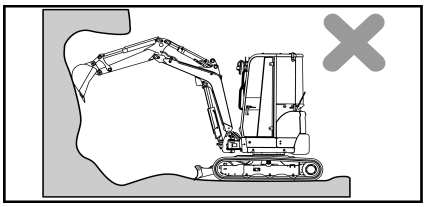
It is possible that the attachment may come into contact with the machine body or the implement. Be careful to avoid such contact during operation.



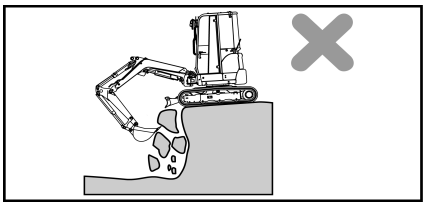
- **Do not rake up objects using the attachment mounted on the implement.**

Do not rake up objects using the attachment since doing so may result in damage to the attachment or the machine.

2.3.2 Dangerous tasks

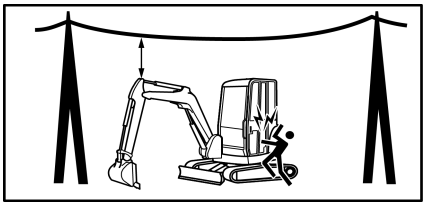


- Digging from the top is dangerous as there is a risk of rock falls or landslides.



- Digging from the bottom is dangerous as this may destabilise and tip over the machine.

2.3.3 Working near electricity lines



⚠ DANGER
Working close to overhead electricity lines is very dangerous and specific precautions must be taken.

- For this manual, you are considered as working near overhead electricity lines once the equipment or your machine's load can reach the minimum distances indicated in the table below.
- Follow these procedures to prevent any accident or injury :
  - Wear shoes with rubber or leather soles.
  - Use a signaller to warn the operator when the machine is too close to an electrical line.
  - If the machine is to enter into contact with a cable, the operator must not leave his seat.
  - Warn all personnel on the ground to stay far enough away from the machine.
- To determine the voltage of the wires on the work site, contact the electricity production company concerned.

	Voltage (V)	Minimum safety distance (m)
Electricity lines	< 50000	3
	≥ 50000	5

⚠ WARNING

This table is provided for information only. Please refer to the regulations in force in your country.

2.3.4 Working near obstacles

- When moving in a tunnel, under a bridge or when you are working in an area near tall obstacels, drive the machine carefully to avoid knocking the boom, the arm or the accessory against these obstacles.

2.3.5 Emergency stop and securing the machine

In case of an emergency stop of the machine, immediately put the accessory or load being handled on the ground according to the following procedure:

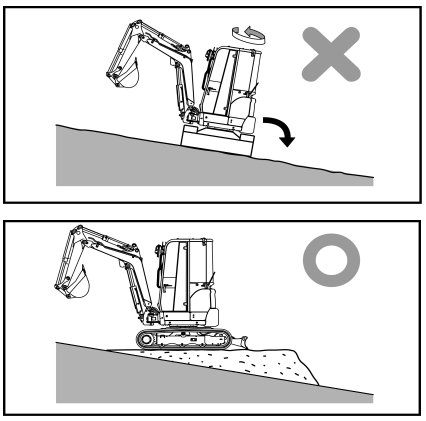
1. In case of hose rupture or imminent dangerous situation due to loss of control of the machine, release the machine controls and immediately lift the safety lever. The machine's power circuits are cut, except the one controlling the blade.

   Note

   If necessary, move the ignition key to OFF to stop the engine.

2. Lower the lock lever.
3. Set the starter key to ON position.
4. Use the joysticks to lower the boom and place the accessory or load on the ground.
5. Raise the lock lever.
6. Turn the key to OFF position to switch off the engine and disconnect the electrical circuit. Remove the key from the ignition.

2.3.6 Working on a slope



- Make sure that the machine does not lose its balance and tip over when rotating the upper structure or when rotating equipment on a slope.
- Do not pivot the upper structure with a load in the bucket.
- If the rotation cannot be avoided, provide a bank to keep the machine as horizontal as possible. Then turn the upper structure.

Note

For the maximum acceptable slope:

1 Specifications, page 183

2.3.7 Working in an area covered with snow

- Ground covered with snow and icy roads are dangerous as the machine may slip, even on a slight incline. Drive the machine at reduced speed; do not stop or turn suddenly.
- Remove the snow carefully as verges or other potential dangers may be buried beneath the snow.

2.3.8 Working on unstable ground

⚠ WARNING

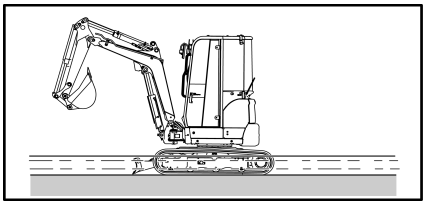
Unstable ground increase the risks of the machine tipping over.

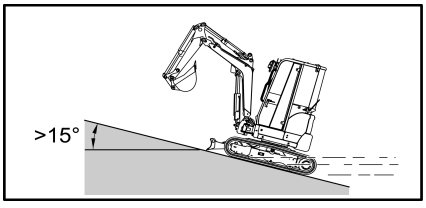
- Keep away from cliffs, verges and ditches as the ground there is unstable. There is a risk that it will give way because of the machine's vibrations or weight, which would cause the machine to tip over or fall. Be careful when working immediately after rainfall or an explosion as the ground is unstable.
- Infills and grounds near trenches are not stable and risk giving way because of the weight or vibrations of the machine, which would cause the machine to tip over or fall. Be very carefull when working on this type of ground.
- When you are working in an area with a high risk of rock fall, wear a helmet and remain under the canopy or in the cab.

2.3.9 Work in narrow road

- Driving in narrow roads can cause a collision with other objects or the machine to tip over.
- Before driving the machine in narrow roads, check the machine's outer dimensions and the road width. When driving on roads likely to cause the machine to hit other objects or with soft shoulders, implement reinforcement or other appropriate measures, and deploy guides to secure the machine.

2.3.10 Working in a submerged area





- Before you use the machine in a submerged area, examine the condition of the ground and the depth and flow of the water.
- The maximum depth of water in which the machine may be used is located up to the centre of the carrying roll.

IMPORTANT

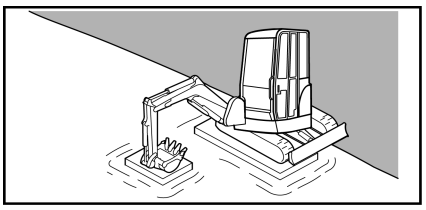
When you come out of the water, if the machine is climbing a slope with an angle of over 15°, there is a risk that the rear of the upper structure will remain submerged in the water, which risks damaging the radiator when it stirs up the water. Be aware of this when you exit the water.

- After use, apply a large quantity of grease to the moving parts (in particular the bucket pin) which have been submerged in water for a long period until the grease used is extruded from the bearings.
- Then wipe off the extruded grease with a cloth.

2.3.11 Working in a muddy area

- Operate the machine carefully so that it does not get stuck. If it does get stuck, release it using the following procedures.

If only one track is stuck

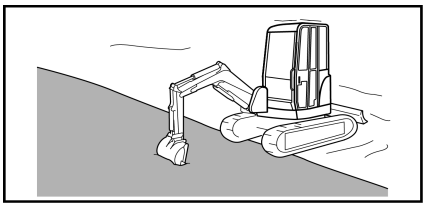


1. Place the bucket on the muddy side.
2. Lift the track.
3. Place wood or a wedge under the track runners.
4. Raise the bucket.

IMPORTANT

When you raise the machine, support yourself on the ground with the lower part of the bucket (and not with the teeth). The angle between the boom and the arm must be 90° to 110°.

If both tracks are stuck



1. Place a log or piece of wood under the tracks.
2. Push the bucket into the firm ground.
3. Retract the arm as if to dig and move forward with the side movement levers to get out of the mud.

2.3.12 Working in an area with reduced visibility

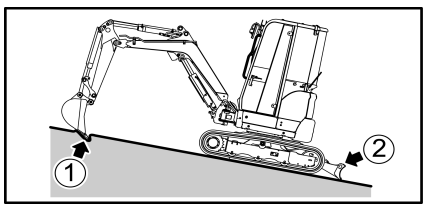
- When working in a dimly-lit area, switch on the lights and front headlights and provide additional lighting if necessary.
- Stop all work when fog, snow or rain hinders your visibility.

2.4 Parking precautions

IMPORTANT

Park the machine preferably on a stable, flat and level surface.

- If you need to park on a slope:



1 = Bucket in the ground

2 = Blade in the ground

1. Verify that the ground offers sufficient stability over time to maintain the machine position.
2. Place the blade on the side of the slope and plant it in the ground.
3. Place the bucket opposite the blade and plant it also in the ground.
4. If you can not follow this procedure, add a wooden wedge on the uphill side of the slope at the tracks.

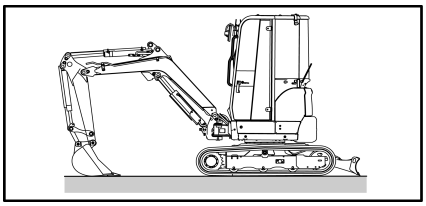
- Stopping the engine:

1. Release the right and left side movement levers in neutral position to stop the machine.
2. Run the engine on idle with the accelerator lever.

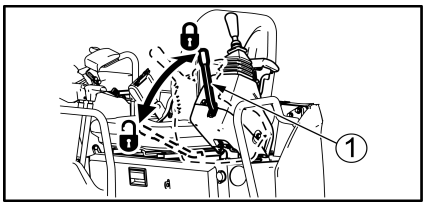
IMPORTANT

Stopping the engine after a rotation at high speed risks reducing its life span. Do not stop the engine suddenly except in an emergency.

If the engine is overheating, do not stop it immediately. Reduce the engine temperature progressively by running it at an intermediate rotation speed before stopping it.

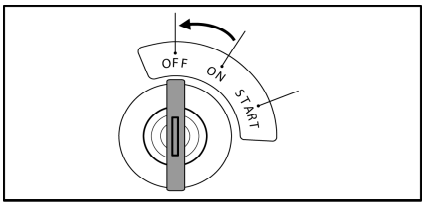


3. Lower the bucket to place its lower surface in contact with the ground.
4. Lower the blade to the ground.



5. Pull the locking levers back.

1 = Locking lever



6. Turn the key to OFF position to switch off the engine and disconnect the electrical circuit.
7. Remove the key from the ignition.

⚠ WARNING

Do not touch the command levers before switching off the engine, or else the equipment or the machine may move suddenly and cause a serious accident.

2.5 Precautions for the accessories

⚠ CAUTION

An accessory that is not adapted to the machine may imbalance it.

- When you mount or remove an accessory, follow these precautions :
  1. Place the machine on flat, firm ground.
  2. Stop the engine.
  3. Keep the parts clean and well greased.
  4. Never mount any accessories that exceed the maximum accepted dimensions.
  5. Do not stay beneath a suspended load.
- The user must read and keep the instructions related to mounting and using accessories.

2.6 Precautions for using optional accessories

- An accessory that is very long may imbalance the machine and cause it to tip over when it descends a slope or pivots on a slope.

2.2.3 Driving the machine on a slope, page 84

2.3.6 Working on a slope, page 90

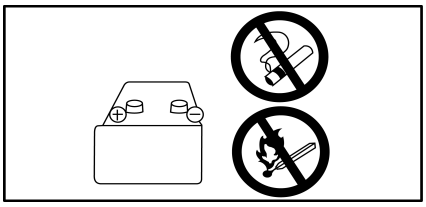
- If you mount a particularly heavy accessory on the machine, the inertia of the upper structure will increase and continue to rotate over a long distance once the rotation lever has been released.
- This may give the operator a false impression of the distance to be respected between the pivoting accessory and a nearby object and may strike the accessory against the object. To avoid this type of accident, stop the rotation as soon as possible.
- Because of the increase in the inertia, the accessory will fall a greater distance away after it has been stopped in the air. There will be major unplanned drift for the accessory.
- Check that the arm and the boom are correctly mounted. If this is not the case, accidents or damage may occur. Contact your dealer if you have any questions relating to mounting the boom or the arm.
- If you mount a long accessory, you may incorrectly estimate the distance between the accessory and a nearby object and strike the accessory against the object. Provide enough room between the long accessories and the nearby objects.

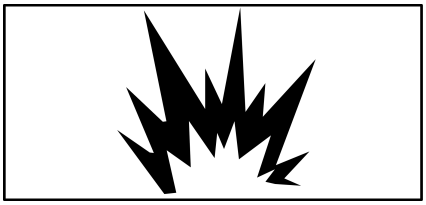
2.7 Precautions for the battery

- The battery is located under cover B.

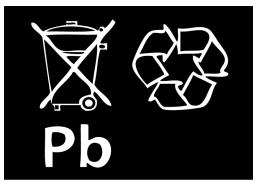
⚠ DANGER

Be careful when handling the battery.





- The battery electrolyte can cause severe burns to the eyes or skin. Always wear safety glasses and clothes when handling the battery.
- If the battery electrolyte comes into contact with your skin or clothes, rinse it off immediately in a large quantity of water and consult a doctor.
- An explosion may occur as the hydrogen produced by the battery is flammable. Keep the battery away from all flames and sparks.
- If you accidentally swallow any of the battery's electrolyte, drink a large quantity of water, milk or fresh eggs and consult a doctor immediately.
- Before inspecting or handling the battery, switch off the engine and turn the starter switch to OFF.
- Make sure that you do not cause a short circuit by touching the battery terminals with a tool.
- If a terminal connection comes loose, sparks may be caused because of a poor contact and may cause an explosion. Make sure that the terminals are connected safely.



- The battery contains lead. It must be collected by specific means.

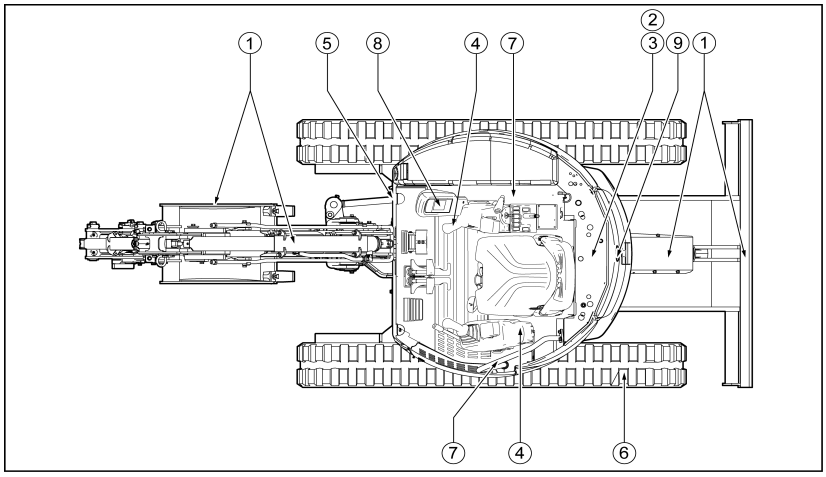
⚠ CAUTION

To start the engine using the connection cables, comply with the procedure described

16 If the battery is discharged, page 139

3 CHECKS BEFORE STARTING THE MACHINE

3.1 Overall visual inspection



⚠ WARNING

If there is any fuel on hot areas or if there are any fuel and/or oil leaks, this may cause a fire. Carefully check these possible causes of fire. If there are any faults, contact your dealer.

1	Check the hydraulic components : wear and leaks around the cylinders, damage to the hoses and connectors come loose.
2	Clean the dust and combustible materials (dead leaves, chips) on areas where heat develops : around the engine, the battery and the radiator.
3	Check that there are no oil leaks from the engine or water leaks from the cooling system.
4	Check that there are no oil leaks from the hydraulic system, the hydraulic oil tank, the pipes and seals.
5	Check that there are no traces of grease or leaks from the hydraulic pipes.
6	Check that there are no cracks, wear or play on the bolts and there are no oil leaks on the track rollers (runners, sprockets and rollers).
7	Check that the bolts have not broken or come loose.
8	Check the proper operation and the condition of the operator display station. • If nuts are loose, tighten them if necessary. • If the screen is damaged, replace it with a new operator display station. • Clean the surface of the operator display station.
9	Check that the red ring on the water decantor is pushed onto the lower part of the bowl. If the ring floats in the bowl, this means that water has mixed with the diesel. In this case, take out the bowl and remove the water.

3.2 Checking and topping up the level of cooling fluid

⚠ IMPORTANT

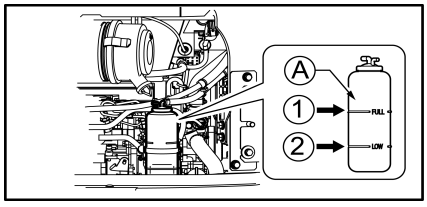
If the expansion vase is empty, check for leaks and the water level in the radiator.

If the water level in the radiator is low, top up the radiator and then the expansion tank.

⚠ WARNING

Only remove the radiator cap to top up the radiator.

- Check the level of cooling fluid every day according to the following procedure :
  1. Place the machine on flat ground.
  2. Stop the engine.
  3. Wait until the engine and the radiator have cooled down.
  4. Lock it with the safety rod.
  5. Check that the level of liquid in the expansion vase is between the minimum and maximum markers.



A = the expansion flask

1 = maxi

2 = mini

- If the level is below the min marker:
  1. Remove the cap from the expansion tank.
  2. Top up to the maximum marker.
  3. Close the expansion tank again.
  4. Close the engine bonnet.

For the fluids and quantities to use, refer to:

2 Recommended greases and fluids, page 150

3.3 Checking and topping up the engine oil level

⚠ WARNING

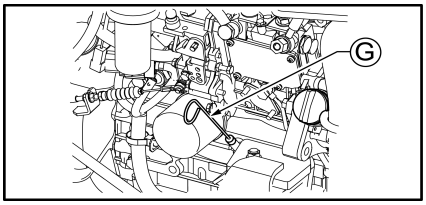
At operating temperature, the oil and the gauge area are hot.

Avoid the hot oil or the components coming into contact with your skin to avoid any physical injuries.

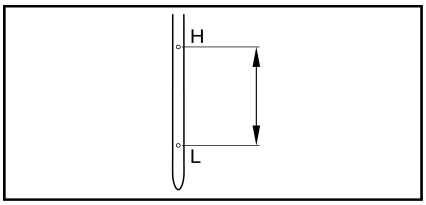
⚠ IMPORTANT

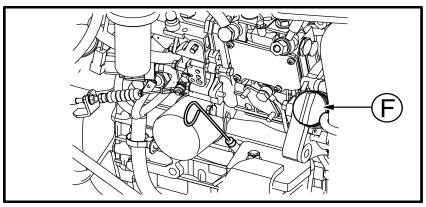
Do not over-fill. Excess oil may cause white smoke, engine overspeed or internal damage.

Do not allow any impurities to contaminate the engine oil. Carefully clean the cap, the gauge and the surrounding area before removing the cap.

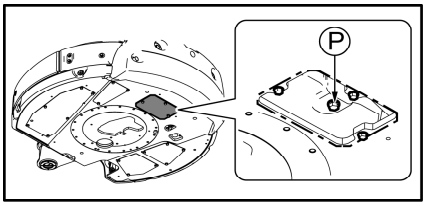


G = Gauge





F = Filler hole



P = Drain plug

1. Wait until the engine has cooled down.
2. Open the bonnet with the ignition key. Lock it with the safety rod.
3. Read the engine oil gauge.
4. Clean the gauge with a cloth to remove any oil deposits.
5. Insert the gauge into its tube.
6. Remove it. The engine oil level must be between markers H and L.

- If the oil level is below marker L, open the filling hole and top up to marker H.
- If the oil level is above marker H, remove the excess quantity of oil via the drainage cap then check the level again.

Note

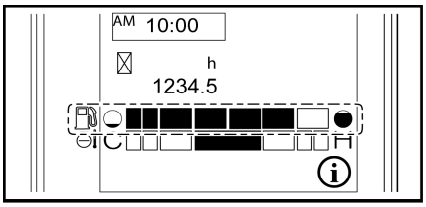
Do not pour the excess engine oil onto the ground or the road.

For the fluids and quantities to use, refer to:

2 Recommended greases and fluids, page 150

3.4 Checking and topping up the fuel level

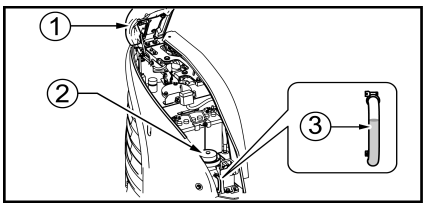
⚠ WARNING
If you spill any fuel, wipe it up with a cloth.



= Full

= Empty

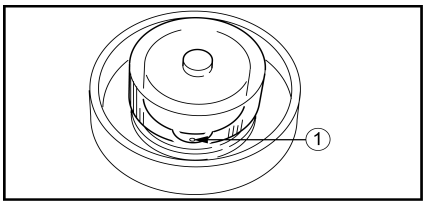
1. Set the starter key to ON position.
2. Determine the fuel level by looking at the fuel gauge on the dashboard.
3. Set the starter key to OFF position.
4. Top up if the level is low.
   a. Open cover B using the starter key.
   b. Take the cap off the tank.
   c. Top up through the filler hole, keeping an eye on the gauge located on the tank.



1 = Cover B

2 = Cap

3 = Diesel gauge



1 = Tank vent

5. Close the tank again.
6. Close cover B.

Note

If the cap vent holes are plugged, the pressure in the reservoir may vary and the fuel supply will be faulty. To avoid this happening, clean these vents air holes regularly.

For the fluids and quantities to use, refer to:

2 Recommended greases and fluids, page 150

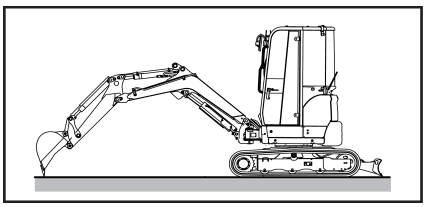
3.5 Checking and topping up the hydraulic oil level

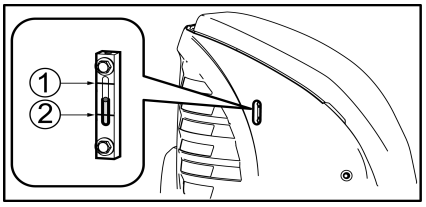
⚠ CAUTION

When you remove the cap from the oil filling opening, loosen it gently to release the pressure from the tank and avoid any high pressure oil leaks that would be dangerous.

⚠ IMPORTANT

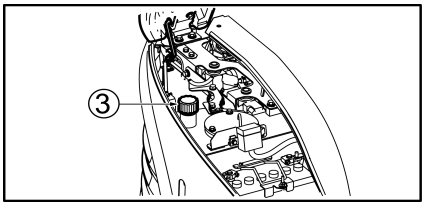
Do not top the hydraulic oil over the upper limit marker on the oil level gauge. An excessive quantity of hydraulic fluid may damage the hydraulic system by applying too much pressure to these components, which would cause a dangerous high pressure leak.





1 = Upper limit

2 = Lower limit



3 = Filler hole

1. Put the machine in the position shown opposite: blade back and lowered to the ground, equipment parallel to the tracks, boom cylinder half out, arm cylinder retracted to the end of its run, bucket teeth on the ground.
2. Stop the engine.
3. Determine the oil level by looking at the gauge on the right hand side of the machine.

   The ball must be between the gauge's upper and lower markers.
4. If the oil level is below the minimum marker, top up as follows :
   a. Open cover B using the starter key.
   b. Open the hydraulic oil tank opening cap.
   c. Top up through the filler hole, keeping an eye on the gauge located on the tank.
5. Close the tank again.
6. Close cover B.

Note

The oil level varies according to the oil temperature.

- Before start-up, the oil level must be on or around the central point of the gauge scale (oil temperature : 10 to 30°C).
- During normal operation, the oil level must be around the upper limit marker on the oil gauge scale (oil temperature : 50 to 80°C).

For the fluids and quantities to use, refer to:

2 Recommended greases and fluids, page 150

4 CHECKS AFTER START-UP

⚠ WARNING

Emergency stop : if an abnormal action occurs, turn the key in the ignition switch to the OFF position. The electrical system is interrupted and the engine stops. Ask your dealer to check the machine.

If you do not use the pre-heating, the machine may respond slowly to the command levers or not operate correctly, especially in cold weather.

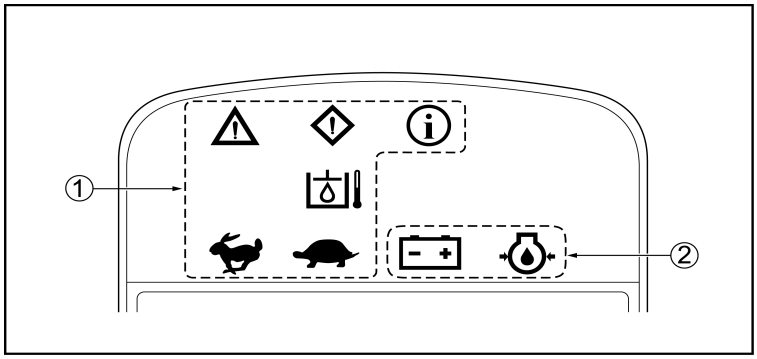
IMPORTANT

The hydraulic oil must be at a temperature from 50°C to 80°C. If the temperature is low, wait until it reaches 20°C before using the equipment. If you need to use a command lever before the oil reaches this temperature, handle it gently.

Do not accelerate suddenly if the engine is not hot.

After the engine starts, do not use the machine immediately but respect the following procedure :

1. Run the engine on idle.
2. Check that the indicator lights correspond to the following statuses :



1		
2		2s

3. Check that the gauges correspond to the following statuses :
   - **5.1.4 Diesel gauge, page 18**
   - **5.1.5 Cooling fluid temperature indicator, page 19**
4. Pull the throttle lever to the centre point between idle and full throttle.

Run the engine about 5 minutes with no load at the intermediate rotational speed.

5. Unlock the locking levers and lift the bucket from the ground.

4 Checks after start-up

6. Use the joysticks to extend and retract the bucket and arm cylinders to the end of their run. Alternately run the bucket cylinder for 30 seconds then the arm cylinder for 30 seconds over a total duration of around 5 minutes to raise the hydraulic oil temperature to at least 20° C.

IMPORTANT

When moving the accessory, make sure it does not hit the ground or the machine.

IMPORTANT

Check that there is no abnormal noise in the hydraulic circuit.

7. Check the colour of the exhaust gas, the noise and the vibrations of the machine.
8. Raise the locking lever to ensure that no handling of the equipment and no rotation of the upper structure is possible with the joysticks.
9. Unlock the locking lever and activate the joysticks to check that everything is operating normally.

⚠ **IMPORTANT**

If you observe the slightest anomaly during this procedure, contact your dealer.

5 CHECKS AFTER USE

- Check the global aspect of the machine.
- Check there are no cracks or damage.
- Check that no nuts or screws are missing.
- Check for leaks.
- Lock the cab (if fitted) and the hoods.

If the machine is used in a rocky place :

- Check for damage to the lower chassis.

If the machine is used in a dusty place :

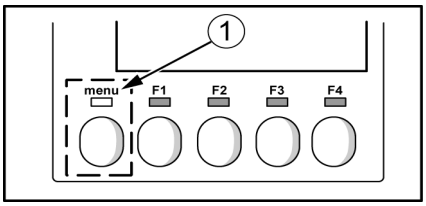
- Check whether the air filter is clogged.
- Check the air filter cartridge regularly.
- Check whether the radiator vents are clogged.
- Clean or replace the fuel filter cartridge regularly.
- Clean the electrical equipment, particularly the starter and the alternator to avoid any dust deposits.

If the machine is used in mud, snow or sand :

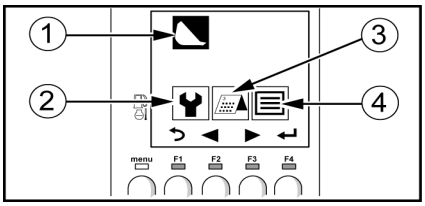
- Clean the machine.
- Apply grease to all equipment axes that have been submerged in mud, snow or sand.

⚠ IMPORTANT
If you detect any faults, contact your dealer.

6 Operator LCD display station interfaces



1 = Menu change



1 = User Interface

2 = Maintenance interface

3 = Machine usage management interface

4 = Configuration interface

1. Press the "Menu Change" button to access the main menu.
2. Move the selection with the navigation keys F2 (◄) and F3 (►) on the icon to select.

The colour of the selected icon is reversed (the icon background becomes black) and it is displayed above the other icons.

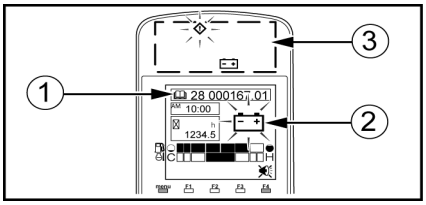
3. Confirm the selection by pressing F4 **(↵)**

6.1 Indication of functions

This section of the menu indicates the functions of buttons F1 to F4.

⮌	Return to previous menu.	(R)	Reset the selected value.
◄	Move the cursor over the object to the left of the one selected.	ⓘ	Displays the details of an information notice (maintenance notice for example).
►	Move the cursor over the object to the right of the one selected.		Stop the buzzer that sounds when a problem arises.
▲	Move the cursor over the object above the one selected.	↵	Select an object or validate a parameter.
▼	Move the cursor over the object below the one selected.	⊞	Increase the selected value by 1

6.2 User Interface



1 = Error Code

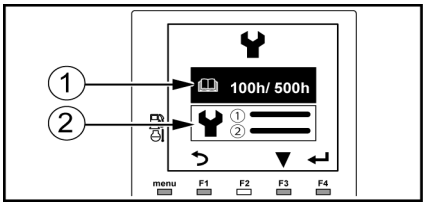
2 = Error Icon

3 = Indicator lights

- The user interface displays the machine use information (hour meter, fuel gauge) and information after a failure (error code and error icon).
- In case of malfunction, the visual indicator LED lights up, the error code is displayed with the icon and the buzzer sounds.
- For more information about the information displayed on the monitor

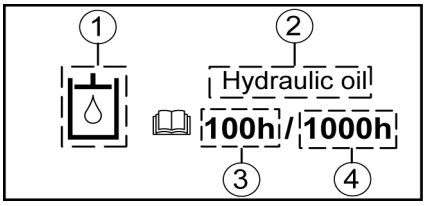
5.1.1 Indicator lights, page 16

6.3 Maintenance interface



1 = Displays the maintenance interval screen

2 = Displays the maintenance history screen



1 = Maintenance object icon

2 = Maintenance object name

3 = Time accumulated since the previous maintenance

4 = Maintenance interval

- This interface allows you to check the maintenance periods and cumulative elapsed time since the last maintenance for each maintenance object.
- Information icon appears on the screen indicating that the maintenance period for an object has been reached.

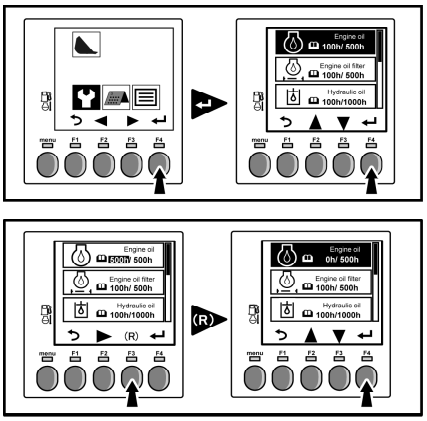
IMPORTANT

The maintenance time accumulator must be reset after the maintenance is performed.

- The date, duration and number of hours indicated on the hour meter are recorded in the maintenance history.

6 Operator LCD display station interfaces

Resetting the accumulated maintenance time



Following the maintenance completion, reset the maintenance time accumulator:

1. Select the maintenance interface.
2. Select the maintenance object using F4.
3. Reset the maintenance time by pressing F3.

Maintenance time goes to 0.

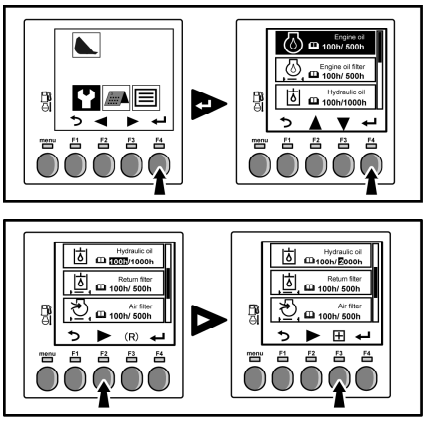
Note

To cancel the maintenance time reset, press F1.

4. Press F4 to complete the process.

The display returns to the maintenance interface and a confirmation sound is emitted.

Changing the maintenance interval



To change the maintenance interval, follow this procedure:

1. Select the maintenance interface.
2. Select the maintenance object using F4.
3. Press the F2 key to select the first digit.

Note

To select the thousands, hundreds or tens digits, repeatedly press F2.

4. To edit the highlighted number, press F3 to increase the value by 1 until you reach the desired value.
5. Press F4 to complete the process.

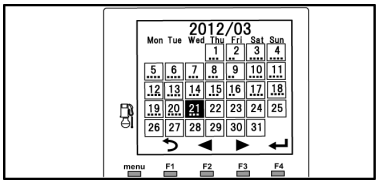
The display returns to the maintenance interface and a confirmation sound is emitted.

6.4 Machine usage management interface

- This interface allows you to check the machine hours of operation over a period of 90 days.

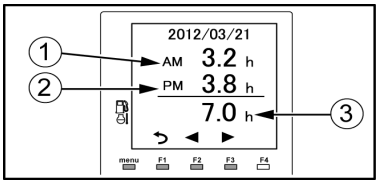
Hours of machine use for the selected month:

- The number of operating hours is shown approximately by a number of chips under the corresponding date and a time span:



■ 0.5~2.0h
■■ 2.0~4.0h
■■■ 4.0~8.0h
■■■■ 8.0h <

Hours of machine use for the selected day:



The hours of machine operation are displayed as follows:
1 = Number of hours in the morning.
2 = Number of hours in the afternoon.
3 = Total operating hours for the day.

6.5 Configuration interface

This interface allows you to change the settings shown in the table below.

	**Language:** Changes the language used by the various interfaces.
	**Date and time setting:** If the battery in the machine is removed, the date and time settings will be reset.
	**Sound parameter:** Adjusts the monitor to emit a confirmation sound when a button is pressed. The buzzer sounds when the settings are changed or when a malfunction is detected can not be removed.
	**Brightness setting:** Adjusts the brightness of LED visual indicators and the LCD screen when the work light is in operation.

7 USING THE MACHINE IN COLD WEATHER

7.1 Preparation for use in cold weather

- In cold weather, you may have difficulty starting the engine because the coolant and fuel can be frozen.
- Consequently, take the following measures :

1. Use oil and fuel suitable for the outside temperature.

2 Recommended greases and fluids, page 150

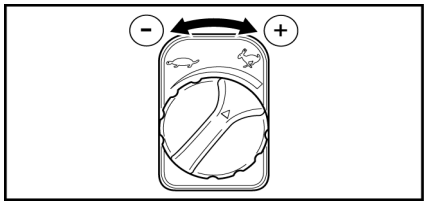
2. Keep the battery charged. In cold weather, remove the battery after using the machine and store it in a heated room to facilitate restarting the machine.

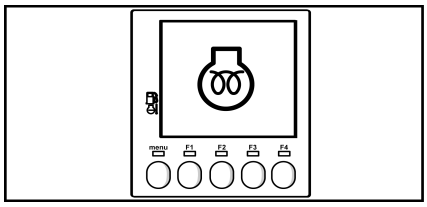
7.2 Starting in cold weather

⚠ WARNING

Consult these pages and respect these safety instructions before starting up the machine.

2.1 Precautions before using the machine , page 78





1. Set the engine speed switch setting between idle and full throttle positions.
2. Turn the key to the ON position.
   a. Keep the key in the ON position to warm up the engine until the "warm-up" icon no longer appears on the screen.
   b. When the glow plug icon no longer appears on the screen, turn the key to the START position to start the engine.
   c. Release the key after the engine starts and it will return itself to ON position.
3. When the engine speed increases, push the accelerator forward to the idle position.

⚠ IMPORTANT

Do not leave the key in START position for over 10 seconds.

If the engine does not start, position the key at OFF. Wait 30 seconds then restart the engine.

Moving or operating the machine without warming it up first may affect its performance.

7.3 Precautions after use

To avoid that the machine is jammed due to mud, water or frozen deposits on the rubber tracks :

1. Remove the mud or water stuck to the machine.
2. Park the machine on firm, dry ground or place boards on the ground and park the machine on these boards to avoid the tracks freezing on the ground.
3. Drain the water built up in the fuel system by turning the evacuation tap to avoid and freezing.
4. Cover the battery or place it in a warm place and reinstall it on the machine the next morning.

7.4 When cold weather is over

- When the exterior temperature increases, replace the engine oil and the fuel.

2 Recommended greases and fluids, page 150

8 RUBBER TRACKS

8.1 Correct use of rubber tracks

- Rubber tracks have certain advantages over steel tracks. However, you cannot get the full benefit out of rubber tracks if you use them in the same way as steel tracks.
- Use the rubber tracks moderately according to the conditions at the work site and the type of work.
- The track tension should be adjusted according to the work zone.

8.2 Comparison between rubber tracks / steel tracks

	Rubber	Steel
Low vibrations	◊	□
Gentle side movement (does not jerk)	◊	○
Silent side movement	◊	□
Less damange to the ground	◊	□
Simple operation	◊	□
Resistance	□	◊
Traction power	◊	◊

◊ = excellent

○ = good

□ = ordinary

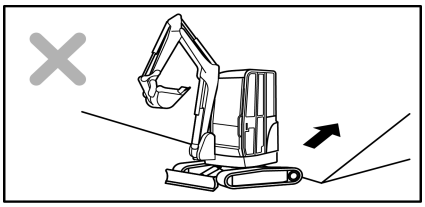
- The rubber tracks have certain advantages that are inheritent to the material's unique properties. It is essential that you perfectly understand the properties of the rubber tracks and comply with the handling and operating precautions for these tracks to extend their life span and get the most out of them.

8.3 Rubber track warranty

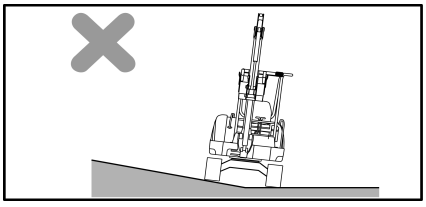
- The rubber tracks are not guaranteed for repair and replacement if they are damaged following careless use by the user : lack of check of the track tension or incorrect maintenance, use of the tracks on surfaces or terrain likely to damage them.

8.4 Precautions for using rubber tracks

- Do not use them or pivot them on broken stones, a hard, rough rock base or around steel or iron rods or the edges of iron plates.
- Do not use the machine on rocky ground such as a river bed as there is a risk that the tracks will be damaged by gravel entering the runners or the tracks becoming loose. Pushing earth by force will reduce the tracks' life span.
- Avoid the rubber becoming stained by oil, fuel or chemical solvents. If the tracks are dirty, wipe them immediately. Do not travel across oily surfaces.
- When you do not use the machine for a period of over 2 months, avoid placing the tracks in a place that is directly exposed to sunlight or rain.
- Never drive on heated surfaces such as fires in the open air, a steel plate exposed to the sun or a hot asphalt road.
- Never drive on a track when the other track is held above the ground with the equipment. This may damage the tracks or cause them to come off.
- Never turn on the spot on concrete or asphalt roads.
- Do not suddenly change the speed. You risk wearing or damaging the track.
- Never rotate on ground with a significant difference in level. Climb a step at a right angle to avoid the tracks coming off.
- Gently lower a machine that has been raised from the ground with the equipment.
- We recommend not to handle materials that become oily once crushed (soya, wheat grains, compressed colza oil yeast, etc.). After use, clean the machine fully with water.
- We recommend not to handle materials such as salt, ammonium sulphate, potassium chloride, potassium sulphate or super lime biphosphate. Transporting these materials risks damage the metals' adhesion. After use, clean the machine fully with water.
- Avoid the tracks coming into contact with concrete walls.
- The tracks tend to slip on snow or icy roads. Check that you do not slip when moving or working on a slope in cold weather.
- Operating the machine in extremely cold weather may damage the rubber tracks and reduce their life span. Given the physical characteristics of rubber, observe the operating temperatures specified in this manual.
- Do not damage the tracks with the bucket when using the machine.

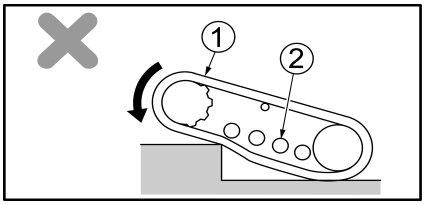


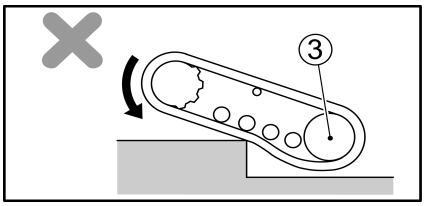
- Do not drive on the boundary between a flat surface and a slope to climb in reverse. Otherwise, reduce the speed.

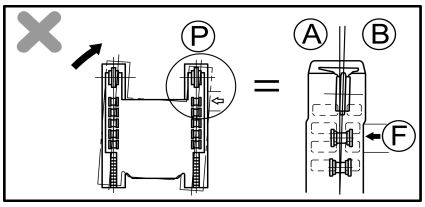


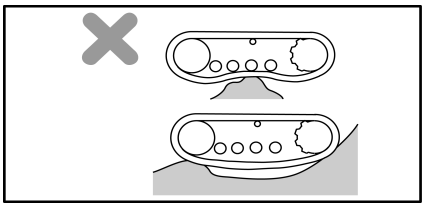
- Do not drive with a track on a slope or convex surface (one that generates an angle of over 10°) and the other track on flat ground; this will damage the tracks. Drive with both tracks on the same flat surface.

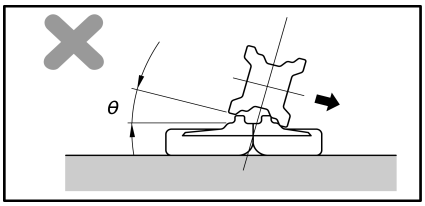
8 Rubber tracks

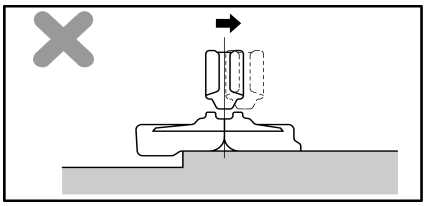












• Keep the tracks at their adequate tension to avoid them coming off. If the tension is too low, the machine can throw a track in the following circumstances:

– when there is a significant difference in level, there is a spacing between the tracks and the rollers.

1 = Track

2 = Track roller

– when you carry out side movement in reverse, there is another spacing between the tension roller and the track.

3 = Idle wheel

– when the machine is moving although the tracks have been blocked to the side by an obstacle.

– when the idler pulley and the rollers are not aligned with respect to the tracks.

A = Chassis side

B = Rubber track side

– when you are reversing under these conditions.

9 HANDLING THE BUCKET

9.1 Machine stability when using with a bucket or an accessory

- The maximum weight when in use in bucket mode or with accessories that ensures machine dynamic stability in use. It corresponds to the maximum weight allowed at the end of the empty arm.
- This weight is determined for the machine on a flat and firm ground under the most unfavourable conditions and is indicated in the table below.

1 Lifting ViO27-6 Cabin, page 189

X	1150 mm	1400 mm	
kg	310	280	
	345	315	

2 Lifting ViO27-6 Canopy, page 190

X	1150 mm	1400 mm	
kg	300	270	
	335	305	

9 Handling the bucket

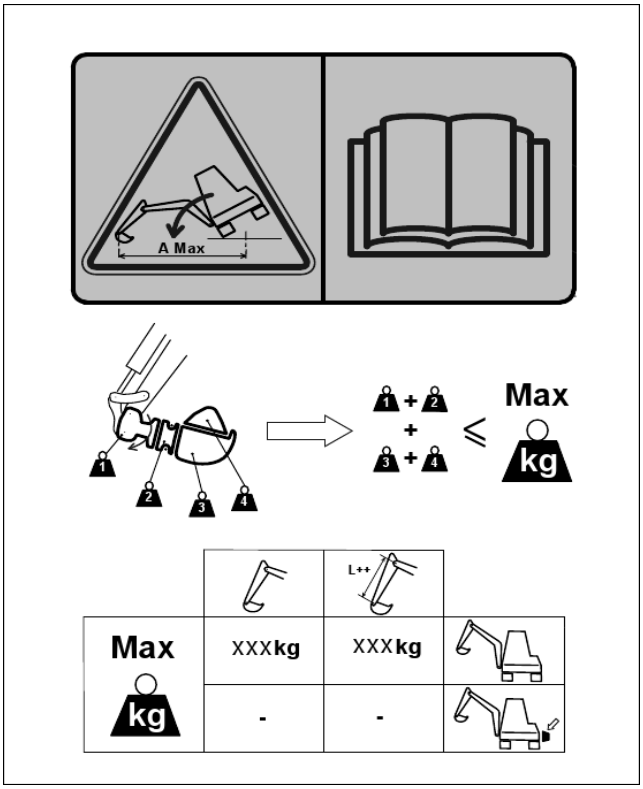
- It must absolutely be taken into account by the operator before using the machine for excavation, levelling operations or in working conditions with the accessories.
- Depending on the machine configuration (arm length, presence of a counterweight…) and working conditions, the operator must make sure that:
  - the equipment and accessories selection is made according to the nature of the task to be carried out and according to the machine's stability limits.
  - the total weight of the quick hitch, the accessories used (bucket, hydraulic hammer...) and the load handled does not exceed the maximum weight allowed.

⚠ DANGER

Any excess can lead to a loss of stability of the machine and tip it over. YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S. accepts no responsibility in case of non compliance with the safety instructions described in this chapter.

⚠ WARNING

When using the machine with a heavy accessory (bucket in loader mode or log loader for example) associated with travel movement, the maximum weight guaranteeing the stability of the machine and the loads shown in the lifting table must be reduced by 20%.



To determine the weight that your machine will handle, make the following calculation:

Weight handled =	
+	Weight of equipped quick hitch
+	Weight of the accessory (hammer, empty bucket...)
+	Bucket load capacity x material density)

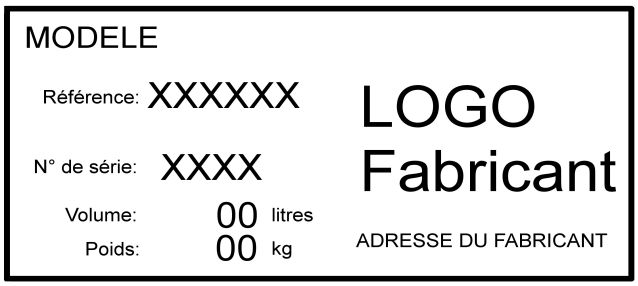
This operation is reminded by a sticker affixed in the cab interior and visible from the driver's compartment.Compare the result with the maximum weight under condition of use with bucket, shovel or with accessories.

Weight of quick hitch and accessories (hammer, empty bucket...):

Please refer to the stickers or C.E. and manufacturer's plates affixed on the accessories mounted on your machine.

C.E. sticker sample

Manufacturer's plate example



Weight of material handled:

The bucket loading capacity (or SAE volume) allows calculating the weight of material handled in the bucket (in case of full buckets) and it takes into account the extra weight caused by the dome piling of certain materials.To determine the weight of materials handled, make the following calculation:

Weight of materials (kg) = Load Capacity (L) x Density

Materials	Density
Sand	1,64
Clay	1,7
Mud	1,8
Gravel	1,5

The density of the materials has a great influence on the weight of the load handled.The opposite table specifies the density of the most commonly handled materials.

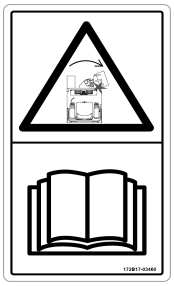
9.2 Compatible accessories

- These accessories are given for 1.8 density materials with a full bucket forming a dome in accordance with ISO standard 7451. For particular operations or with materials of different densities (partial bucket filling due to fluid products such as mud) larger buckets may be used.
- In this case it is the responsibility of the user to ensure that the machine stability limit is not exceeded. The machine could tip over, which could cause serious physical injuries and extensive material damage.

9.1 Machine stability when using with a bucket or an accessory, page 113

⚠ WARNING
The accessories shown in the tables below correspond to the configuration with the most unfavourable stability.

- Do not use accessories that are not listed in this chapter. The user must ensure that the accessory is compatible with the capabilities of the machine and the task at hand. If in doubt, contact the accessory manufacturer or dealer.



⚠WARNING

When using a large accessory, keep the accessory at a sufficient distance from the cab to avoid hitting the cabin with the accessory during the rotation of the boom.

Mounting without quick hitch

Bucket	Retro bucket	G3500
	Ditching bucket	G3C1000
	Swivel ditching bucket	-
	Loading bucket	G3500
		G3C1000
Hydraulic hammer		DMS 165

Mounting with quick hitch

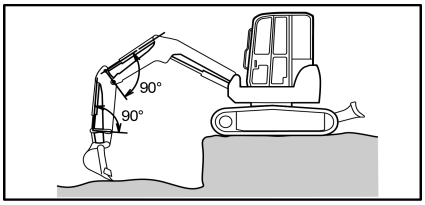
Mechanical quick hitch **L-SYSTEM**	Quick hitch		SW03
	Bucket	Retro bucket	GCS03CT0500
		Ditching bucket	GCS03CC1000
		Swivel ditching bucket	GCS03CP0850
		Loading bucket	GCS03CT0500
			GCS03CC1000
	Hydraulic hammer		DMS 165

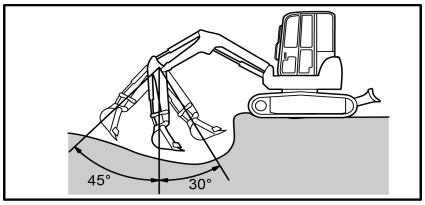
Quick hydraulic hitch **L-SYSTEM**	Quick hitch		HCSW03
	Bucket	Retro bucket	GCS03CT0500
		Ditching bucket	GCS03CC1000
		Swivel ditching bucket	GCS03CP0850
		Loading bucket	GCS03CT0500
			GCS03CC1000
	Hydraulic hammer		DMS165

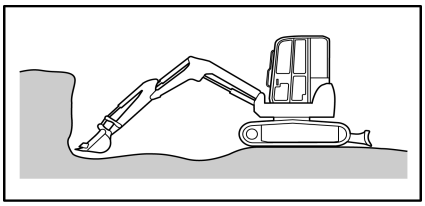
Powertilt **L-SYSTEM**	Quick hitch		PT 030
	Bucket	Retro bucket	GCS03CT0500
		Ditching bucket	GCS03CC1000
		Swivel ditching bucket	-
		Loading bucket	GCS03CT0500
	Hydraulic hammer		-

Mechanical quick hitch **ACB**	Quick hitch	Module	M1
	Bucket	Retro bucket	GMO13R0500
		Ditching bucket	GMO13C1000
		Swivel ditching bucket	-
		Loading bucket	GMO13R0500
			GMO13C1000
	Hydraulic hammer		DMS 165

9.3 Operation of the retro bucket





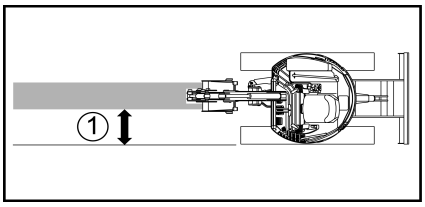


- The retro bucket is adapted to dig the ground at a level below the machine.
- The maximum digging force is obtained when the angle between the bucket cylinder and the bucket arm and the angle between the arm cylinder and the arm is 90°.
- For maximum effectiveness, handle the arm within the range illustrated opposite : 45° forward and 30° back.
- Do not move the equipment to the end of the cylinder run.
- To dig at a level above the machine, install the bucket in the reverse position.

11.2.1 Loading bucket, page 123

9.1 Machine stability when using with a bucket or an accessory, page 113

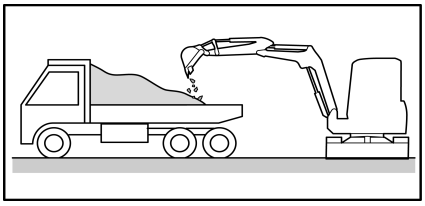
9.4 Digging trenches



1 = Parallel

- To increase the effectiveness of the machine, place an appropriate bucket to dig a trench and position the tracks in parallel on each side of the trench to be dug.
- To dig a wide trench, dig on the two sides then the centre.

9.5 Loading



- To increase effectiveness, position the skip truck at a location where the operator may view it and where the machine's rotation angle is minimised.
- Load the earth from the back of the truck to facilitate loading and maximise the quantity of earth loaded.

10 HANDLING OF ACCESSORIES

10.1 Hydraulic hammer SOCOMEC

Usage recommendations

⚠WARNING

Before using the machine with a hydraulic hammer, close the front wind shield to work safely.

⚠WARNING

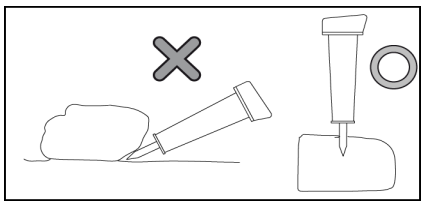
Using the hydraulic hammer with a machine not fitted with a cab requires the driver cab to be fitted with a front protection to work safely.

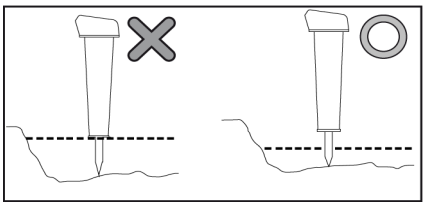
⚠WARNING

During the work phase, keep everyone out of the 20m danger zone.

IMPORTANT

- **The hammer must be at 90° to the working surface.**
- **In a submerged area, make sure that the water does not reach the body of the hammer.**





Note

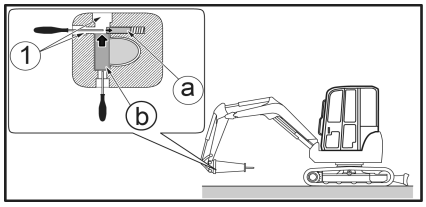
The hammer can only operate within the following temperature range:
[-5°C ~ +45°C]

- To avoid damaging the structure of the hammer and minimize vibration, the operator must be smooth when using the tool.Be sure to set the engine speed if you are using a hammer.
- Once the work requiring the hammer is finished, set the hammer vertically with respect to the ground and leave it in this position to facilitate drainage of condensation on the side of the piston.

10 Handling of accessories

Tool change

1. Park the machine preferably on a stable, flat and level surface.
2. Place the accessory at about 30 cm above the ground in horizontal position.
3. Stop the engine.
4. To remove the tool from the housing:



a. Use a lever to press the pin and to push it into its housing (2 cases possible depending on model).

b. Use a second lever to press the stop swivel pin and push it out completely.

c. Remove the tool from its seat.

1 = Housing

a = Pins

b = Stop swivel pin

5. Apply plenty of grease to the part in the new tool guide.
6. Manually fit the flat end of the tool into the guide.
7. Push and turn the tool in order to position it parallel to the pin housing
8. Use a lever to press the pin stop and make it fit into place
9. Insert the pin until the pin stop returns to its position.

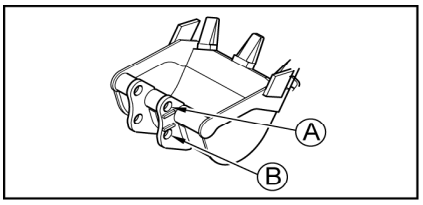
Note

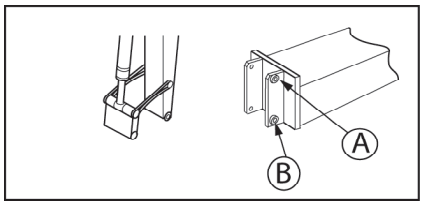
There are different forms of tools that can equip the hammer.Contact your dealer.

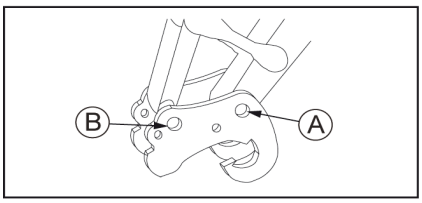
- If the hammer is inactive for a long period, you must:
  - Pull out the tool and, after pushing the piston as high as possible (using a tube) grease it thoroughly and reassemble the tool. This prevents oxidation of the piston end.
  - Shelter the hammer in a confined area that is protected from the weather.

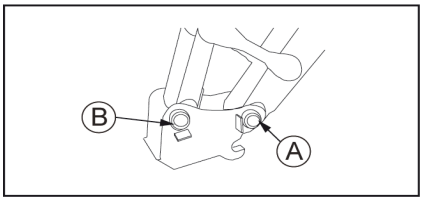
11 ACCESSORY CHANGE BY DIRECT COUPLING

11.1 Dismantling the accessory









A & B = Bucket or attachment bore

1. Place the machine on flat ground.
2. Place the accessory at about 5 cm above the ground.
3. Stop the engine.
4. Clean all the parts.
5. Remove the swivel pin from the A bore and the swivel pin from the B bore.

IMPORTANT

- **Protect the various elements from dirt and dust.**
- **Take care not to damage seals on each bushing side.**
- **Check the good state of o-rings. Replace it if damaged.**

11.2 Mounting the accessory

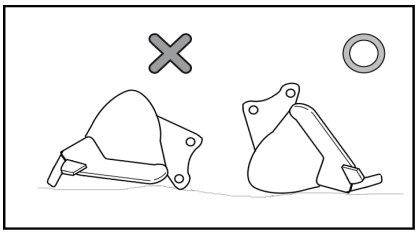
⚠ IMPORTANT

Before using an accessory requiring hydraulic power, check the pressure compatibility from the machine specifications chart.

1 Specifications, page 183

⚠ WARNING

Before mounting a bucket or an accessory on your machine, make sure that:



- **the bucket or accessory is compatible with the capabilities of your machine;**

9.2 Compatible accessories, page 116

- **the bucket or accessory mounting operation is performed on a level and stable ground;**
- **the bucket or accessory is properly positioned to be installed on the machine.**

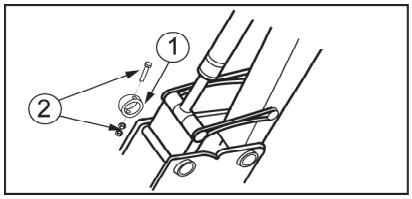
1. Clean and lubricate the bores.
2. Put the o-rings in place.
3. Align the arm bore with the bore A.

Add shims to compensate for play if necessary.

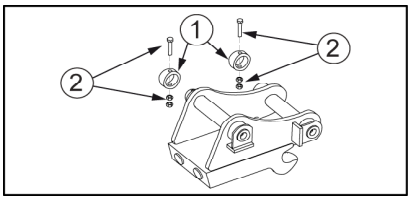
4. Insert the swivel pin into the bore **A.**
5. Align the pin bore with the bore B.

Add shims to compensate for play if necessary.

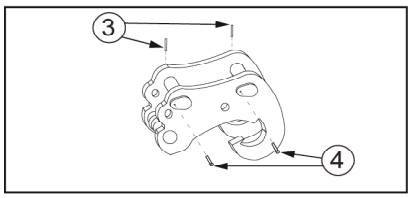
6. Insert the swivel pin into the bore **B.**
7. Install the stop systems depending on the accessory model mounted on the machine.



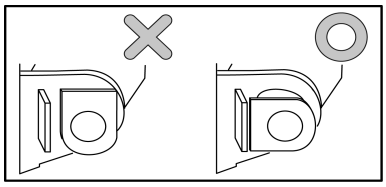
1 = Rings
2 = Bolts



3 = Pins



4 = Set screw



Note

Make sure to install the swivel pin stops correctly by positioning them with the flat plane against the stop.

8. Grease the hinged parts.

Special features concerning the hammers

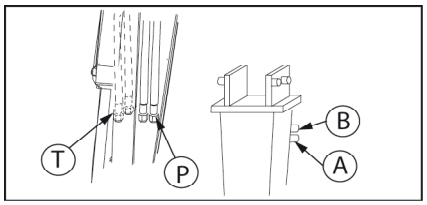
1. Connect the coupled hoses from the hammer to the machine connections.

13 Implementing the 3rd hydraulic circuit, page 125

2. In the absence of quick hitchs, remove the plugs from the hoses on the machine and drain the oil accumulated in the hoses.

Always drain the machine's oil into a safe container and never directly onto the ground.

3. Connect ports A and P, then ports B and T with hydraulic hoses.[2]

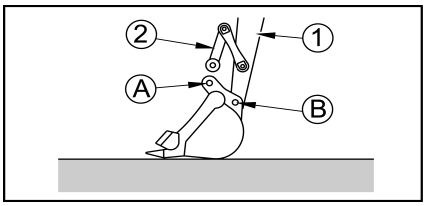


11.2.1 Loading bucket

IMPORTANT

Protect the various elements from dirt and dust.

Take care not to damage seals on each bushing side.



1 = Arm

2 = Bucket link

1. Clean and lubricate the bores.
2. Put the o-rings in place.
3. Align the pin bore with the bucket A bore.

Add shims to compensate for play if necessary.

4. Insert the swivel pin into bore A.
5. Lift the equipment and align the arm bore with the bucket B bore holding the bucket about 5 cm of the ground.

Add shims to compensate for play if necessary.

6. Insert the swivel pin into bore B.
7. Put the stop pins in place on axes A and B.
8. Grease the hinged parts.

2. Depending on the model

12 LOAD LIFTING

Do not hang a load without the kit's lifting facilities.

8.8 Lifting Kit, page 50

⚠ WARNING

It is forbidden to lift loads over people.

Lifting operations are prohibited if the lifting accessory is resting on a sharp edge of the equipment, which could damage it and cause it to drop the load.

⚠ IMPORTANT

It is forbidden to handle the loads without turning on the overload box.

When using the machine for log or long charge handling, the machine must be fitted with a frontal protection structure.

To make lifting a load with the machine, use the following procedure:

1. Check that the WLL[3] of the lifting accessories used are compatible with the load being lifted.
2. See the load tables for your machine so you do not exceed these limits during the lifting operation.
3. Install a device that can oppose the accidental release of the load on the machine's lifting ring (with latch hook, shackle, eye...) and whose WLL[3] is equal to or greater than the load to be lifted.
4. Attach the load to be handled with the lifting accessory.
5. Pass the lifting accessory in the lifting device and lock the device.
6. Turn the overload housing switch to ON located in the machine's cab.
7. Lift the load slowly and smoothly.

   Note

   Never lift a load roughly; the quick movements and sudden stops can cause overloads.

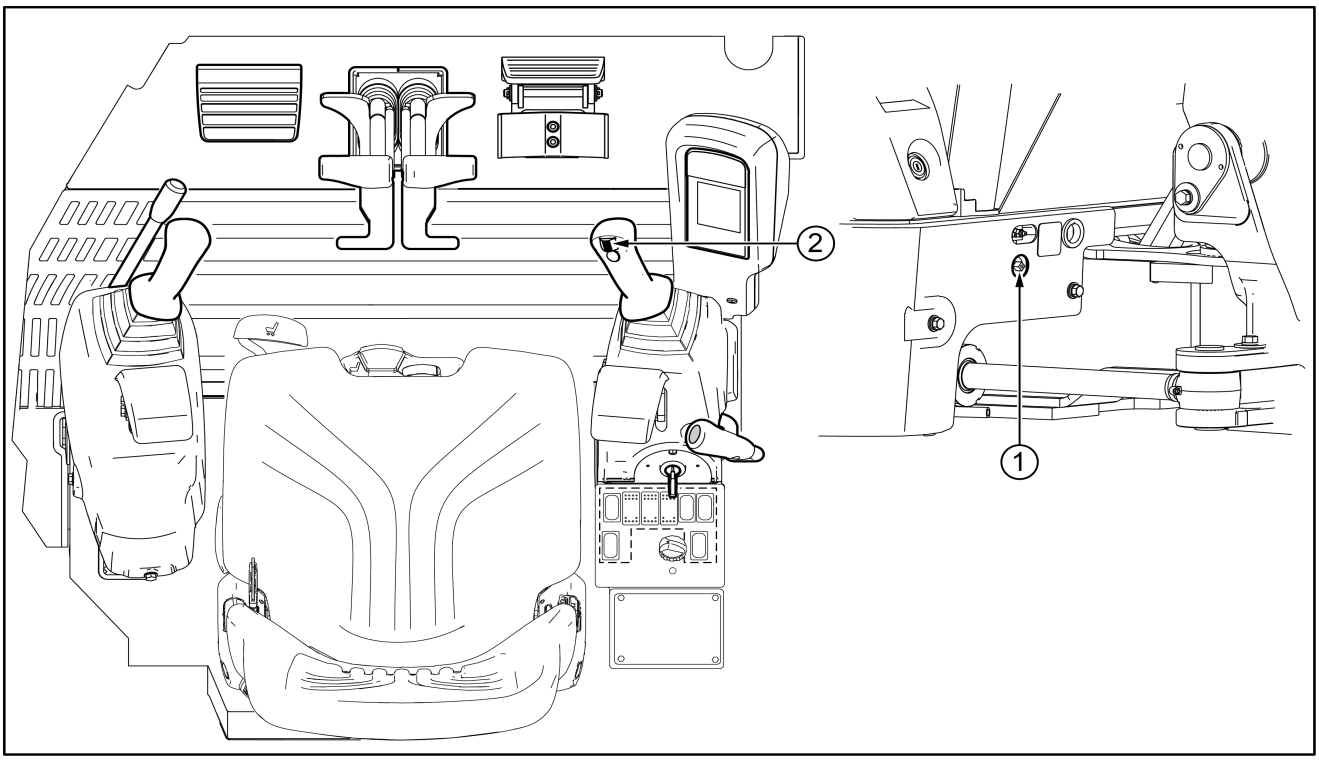
⚠IMPORTANT

Limit the load's lifting height as much as possible during handling.

3. Working Load Limit (WLL)

13 IMPLEMENTING THE 3RD HYDRAULIC CIRCUIT

13.1 Description



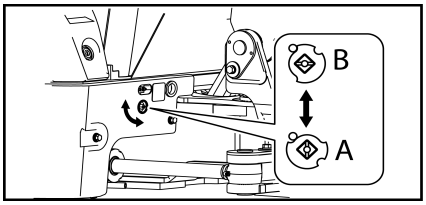
1 = 3rd circuit selector

2 = 3rd hydraulic circuit control

⚠ CAUTION

Do not operate the controls of the 3rd circuit if there are no installed accessories.

13.1.1 3rd circuit selector



- Use this valve to select the 3rd hydralulic circuit in single or dual effect.

A = 3rd circuit - dual effect

B = 3rd circuit - single effect with direct tank return

13.2 Mounting the accessory

⚠ WARNING

Before performing any maintenance operation, remove residual pressure in the hydraulic circuit.

1.1.1 Removing the residual pressure, page 145

Always drain the machine's oil into a safe container and never directly onto the ground.

1. Stop the engine.
2. Remove the caps.
3. Connect the hydraulic tool's hoses.

Hydraulic oil rate at nominal engine speed :

1 Specifications, page 183

13.3 Precautions for using the accessory

- Follow the procedures described in the user manual provided by the accessory's manufacturer.

Hydraulic hammer (single action accessory)

- Set the return pipe selector valve to the position for a single action accessory.
- The hammer works when the proportional roller is operated.

Tilting bucket

- Position the return circuit selector valve to the position for a dual action accessory.
- Use the proportional roller to operate the accessory.

14 TRANSPORTING THE MACHINE

⚠ WARNING

Choose a road taking account of the width, height and weight of the machine loaded on the truck.

Transport the machine safely according to the rules associated with applicable legislation.

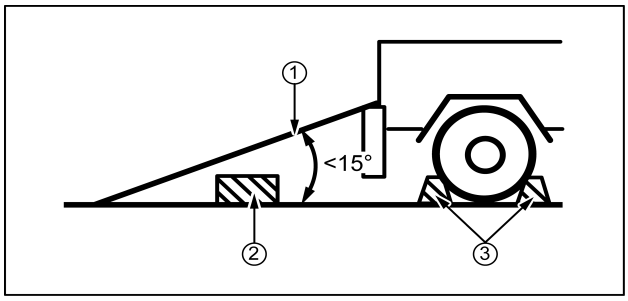
14.1 Loading/unloading the machine

14.1.1 Precautions for loading/unloading the machine

- Load or unload the machine of a flat, firm surface, a good distance away from any verges.
- Use adequate power ramps with hooks at their extremities.
- Make sure the ramps are sufficiently wide, long and thick to hold the machine so that you can load it and unload it safely. If the ramps flex excessively, consolidate them with wedges.
- Install the ramp safely on the truck deck so that they do not become detached.
- Clean grease, oil and any other slippery deposits from the ramps and remove the mud from the tracks to avoid the machine sliding sideways on the plates.
- Do not load or unload the machine if the ramps are slippery due to rain, snow or frost.
- Load or unload the machine at reduced speed.
- Never change the direction of travel on the ramps. If you need to change your path, take the ramps down, and do it on the ground.

14.1.2 Procedure

1. Engage the truck's brake.
2. Position buttresses to immobilise the truck.
3. Position the ramp plates on the truck deck so that the centre of the truck and the centre of the machine are aligned. Check that the left and right ramp plates are at the same level.
4. The angle between the ground and the ramp plates must be less than 15°.



1 = Ramps
2 = Wedge
3 = Stops

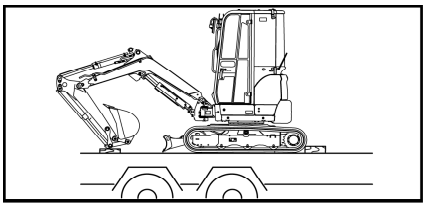
Note

Determine the spacing between the ramp plates based on the centre of the track runners.

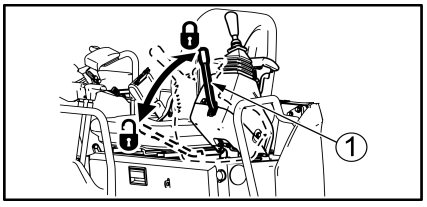
5. Place the accelerator pedal to idle position.
6. Direct the machine towards the ramp plates at low speed and load the machine onto the truck. Do not use levers other than the side movement levers when travelling across the ramp plates.

14.2 Immobilising the machine on the truck

Once the machine is in a suitable position on the truck, immobilise it as follows :



1. Lower the blade to the ground.
2. Fold the bucket and the arm to the maximum, then lower the boom to wedge the arm on a wooden block.
3. Turn the key to OFF position to switch off the engine and disconnect the electrical circuit. Remove the key from the ignition.



1 = Locking lever

4. Lock the control levers with the locking lever.

Note

The hydraulic brake locks the rotation motor.

5. Lock the bonnet, covers and cabin door (if equipped) with the starter switch key to prevent them from opening during transportation.

14.3 Tying down the machine

⚠ WARNING

Do not perform the tie-down if a person stands on the machine or on an accessory.

⚠ WARNING

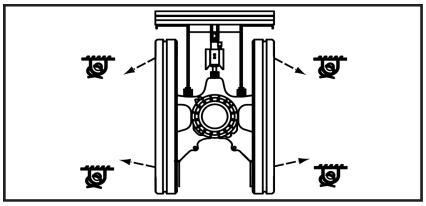
Use a tie-down accessory (belt, chain, cable) compatible with the weight of the machine and compliant with European standards.

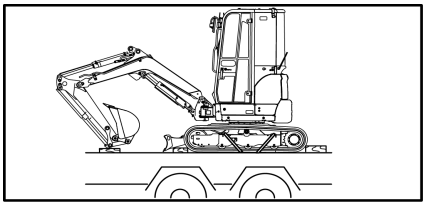
Check the tie-down accessory labelling to know the WLL[4]. In the absence of or damage to the accessory labelling, do not use it without being assured of its WLL[4].

⚠ WARNING

Before transporting the machine, check the total height of the load.

2 Working dimensions, page 184





1. Check the condition of the transport vehicle surface. If the surface is greasy, it must be cleaned before installing the machine on the transport vehicle.

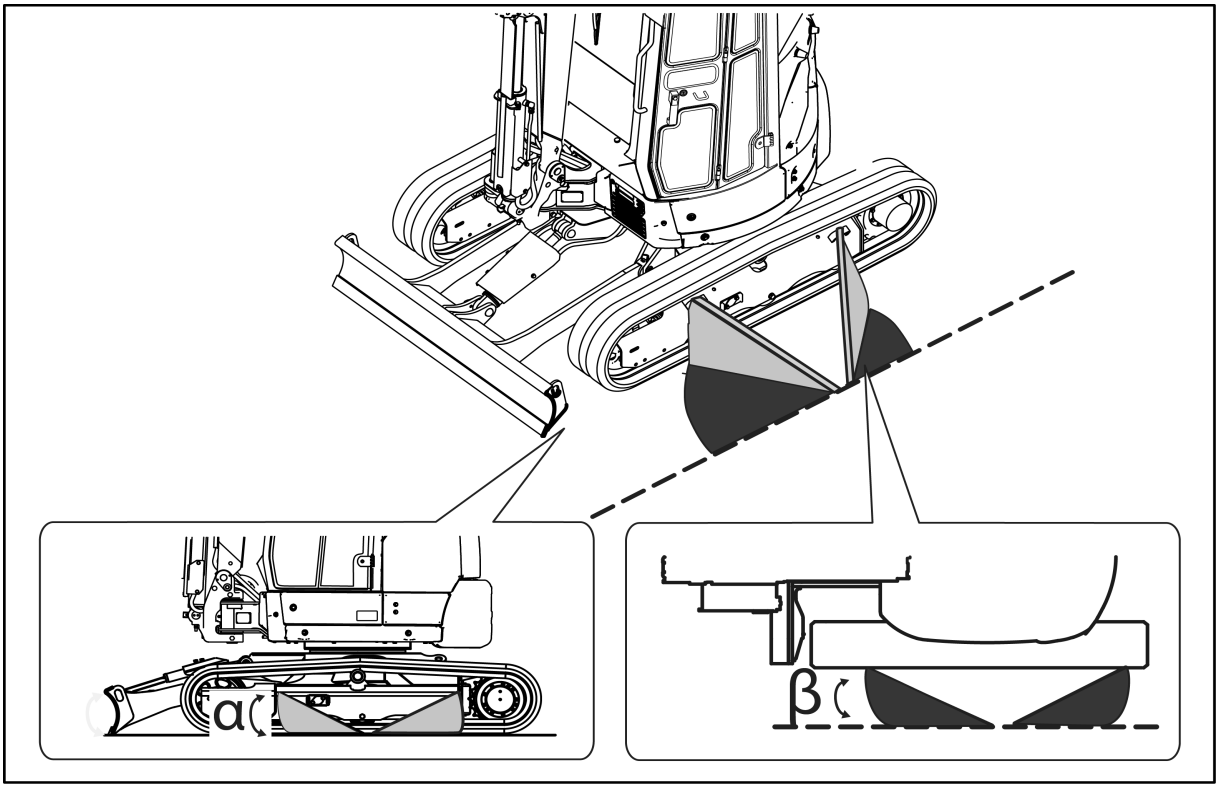
   Note

   If the transport vehicle surface is steel, provide a non-slip mat or spacers to prevent the machine tracks from slipping.

2. Check the WLL[4] of the tie-down points of the transport vehicle, it must be at least the WLL[4] recommended for tying down the accessories.
3. Check the location and condition of the machine tie-down points.
4. Tie-down the machine at the points provided for that purpose and that are indicated on the machine. YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S. recommends securing the machine according to the diagonal direct tie-down method respecting the angles shown below.

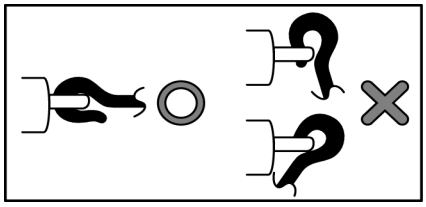
4. Working Load Limit (WLL)

14 Transporting the machine



Angle	Value in degrees
α	20°-60°
β	10°-60°

3 Warning labels, page 7

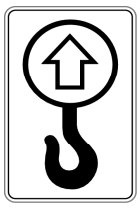


a. Correctly position the hooks on the tie-down points.

b. Be alert to where tie-down accessories pass; they should not rest on sharp edges or have knots present when tying down.

c. Make sure to load balance the various tie-downs and do not overload them.

14.4 Slinging the machine



⚠ WARNING

Never lift the machine with someone on it or on an accessory.

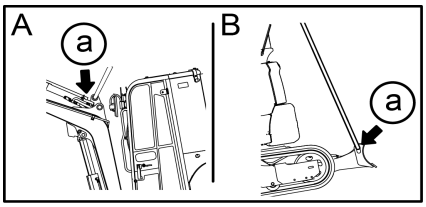
Use a slinging method that is compatible with the weight of the machine and that complies with current standards.

If you do not lift the machine as shown, it will be out of balance.

Do not pivot the machine when it has been raised.

Never walk under or beside a suspended machine.

1. Pivot the upper structure so that the blade is behind the operator's seat.
2. Lift the blade to the maximum limit.
3. Place the equipment in the longitudinal axis of the machine.
4. Place all the equipment cylinders to maximum extension (except the rotation cylinder).
5. Stop the engine, put the levers in the locked position and check that you have left nothing around the operator's seat before leaving the machine.

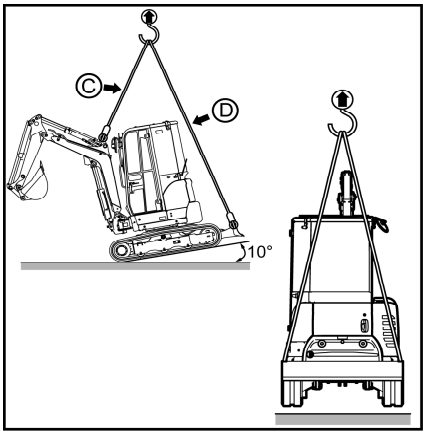


A = Front side

B = Back side

a = Lifting holes at each end

3 Warning labels, page 7



- Lift the machine as follows:

  1. Hook the shackles to the suspension holes at the front (1 point) and the rear (2 points).
  2. Load lifting accessories carefully.
  3. Gently suspend the machine and wait until it stabilises before continuing to lift it.

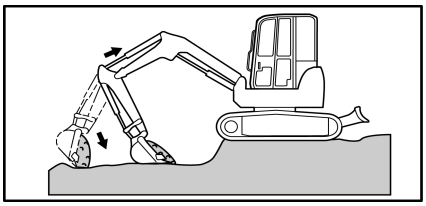
	Length (m)	WLL[5] (t)
C	1,8	4
D	3,5 x 2	2

5. Working Load Limit (WLL)

15 DETECTING ANOMALIES

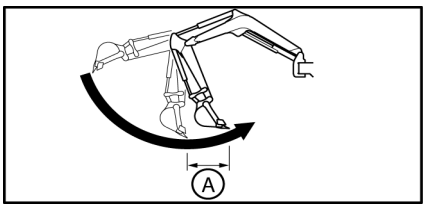
15.1 Phenomena that do not constitute faults

The following phenomena are not faults :



- **Bucket shaking**

When the boom is raised immediately after the arm is extended while the bucket is pulled back, the bucket may shake. This is not a fault.



- **Discontinuous movement of the arm**

When you dig the ground with the arm, the arm may slow down temporarily in an almost vertical position. This is not a fault and occurs especially when the motor speed is low.

A = Slowdown is noticeable on this range.

- **Shift in the position of the upper chassis**

When you turn the machine suddenly, as in turning or pivoting, the upper chassis may be slightly offset.

- **Thermal shock for the side movement motor**

If, during cold weather, the hydraulic oil temperature rises to over 60°C in relation to the exterior temperature, during an unloading operation without movement after the engine starts the machine may not pivot because of a thermal shock. This is not a fault.

- **The rotation cylinder extends during excavation**

The rotation cylinder may extend in certain situations or excavation positions. This is not a fault.

- **Delayed reaction to the response to change of speed**

At slow engine rate, a reaction delay may occur when you reduce the speed. This phenomenon is not a fault.

15.2 Detecting anomalies

- : Indicates that repair is performed by the dealer.
- If an anomaly or a problem occurs and its cause is not one of those indicated below, ask your dealer to carry out a repair.

15.2.1 Engine

Problem	Cause	Solution
The engine oil pressure indicator light comes on.	Lack of engine oil	Fill the engine oil to the required level.
	Too much oil in the oil casing.	Drain the oil from the casing to the specified level.
	Clogged oil filter	Replace the engine oil and the engine oil filter element.
	Defective oil pressure sensor or electrical circuit	Check or replace the electric circuit.
Vapour comes out of the radiator.	Lack of cooling fluid	Check the cooling water level.If necessary, top up the water. Check any water leaks on and around the filling hole).
	Relaxed or broken ventilator belt	Adjust the tension or change the belt.
	Polluted cooling circuit	Drain the cooling circuit, clean it completely and fill it again.
The water temperature alarm light comes on.	Defective thermostat.	Replace the thermostat.
	Radiator blade blocked or twisted.	Clean or repair the blade.
	Defective electric circuit.	Check or replace the electric circuit.
	Cooling fluid leakage	Check and repair.
	Defective water pump	Check and repair.

15 Detecting anomalies

Problem	Cause	Solution
The starter works correctly but the engine does not start.	Lack of fuel.	Top up the fuel tank.
	Air in the fuel circuit.	Repair the air leak. Evacuate the air from the fuel circuit.
	Defective fuel injection pump or injector performance altered.	Replace the pump or the injector.
	Inadequate compression.	Check and repair.
	Blown fuse.	Replace the fuse.
	Stop solenoid damaged. Broken filament.	Check and repair.
	Inadequate fuel.	Replace the fuel with a recommended fuel.
	Clogged fuel filter	Replace the fuel filter.
Black smoke escapes from the machine.	Air filter element blocked.	Clean or repair the element.
	Altered injector performances.	Check and repair.
	Inadequate compression.	Check and repair.
	Overload	Reduce the workload.
	Inadequate fuel.	Replace the fuel with a recommended fuel.
The smoke is white or blue-white.	Too much oil in the oil casing.	Drain the oil from the casing to the specified level.
	Inadequate fuel.	Replace the fuel with a recommended fuel.
	Piston or segment used.	Check and repair.
	Altered injector performances.	Check and repair.
	Abnormal consumption of engine oil	Check and repair.

15.2.2 Electrical equipment

Problem	Cause	Solution
The starter does not rotate or turns slowly.	Defective electric circuit.	Check and replace the electric circuit.
	Defective starter switch.	Replace the starter switch.
	Battery insufficiently charged.	Recharge the battery.
	Faulty starter	Check and repair.
	Blown fuse.	Replace the fuse.
	The circuit breaker is in the OFF position	Turn the circuit breaker to the ON position.
	The locking levers are in the un-locked position	Place the locking levers in the locked position.
The maximum engine speed does not provide enough power to the lights.	Defective electric circuit.	Check the play and the proper con-nection of the terminals. Repair if necessary.
	Defective alternator or regulator.	Check and repair.
When the engine is running, the lamp is very bright and burns out frequently.	Faulty alternator	Repair / replace
Battery leak.	Defective battery.	Replace the battery.
The battery charge indicator lights up.	Relaxed or broken ventilator belt	Adjust the tension or change the belt.
	Defective electric circuit.	Check and repair.
	Defective battery.	Replace the battery.
	Insufficient energy generated by the alternator	Check and repair.

15 Detecting anomalies

Problem	Cause	Solution
The indicator lights do not light up when the start key is set to ON.	Blown light or defective electrical circuit	Check and repair.
The horn does not make any sound	Defective switch	Check and repair.
	Defective horn	Replace the horn.
	Defective electric circuit.	Check and repair.
	Blown fuse.	Replace the fuse.
The headlights do not light up.	Defective headlight	Check and repair.
	Defective switch	Check and repair.
	Defective electric circuit.	Check and repair.
	Blown fuse.	Replace the fuse.

15.2.3 Machine structure

Problem	Cause	Solution
The power or speed of the moving parts is low.	Lack of pressure due to wear on the hydraulic pump.	Replace the hydraulic pump.
	Pressure drop in the distributor below the set value.	Check and repair the valves.
	Damaged hydraulic cylinder or hydraulic motor	Check and repair.
	Insufficient quantity of hydraulic oil.	Fill the hydraulic oil to the required level.
	Clogged filter.	Clean or replace the filter.
	Overload	Reduce the workload.
	Clogged pilot valve	Clean
	Presence of air at the suction of the pump	Check and repair hoses and seals.
	Viscosity of hydraulic oil too high	Replace with hydraulic oil of adequate viscosity.
	Defective pilot valve	Check and repair.
The machine does not move forward in a straight line.	Track incorrectly tightened or foreign body jammed.	Adjust or clean.
	Damaged hydraulic motor.	Check and repair.
	Defective hydraulic pump.	Check and repair.
	Faulty swivel joint.	Check and repair.
	Defective safety valve.	Check and repair.
	Sprocket, tightening roller or tracker roller damaged.	Check and repair.

15 Detecting anomalies

Problem	Cause	Solution
One side of the sprocket is worn or the track is loose.	Anomaly of the hydraulic cylinder for the adjustment of the tension.	Check and repair.
	The undercarriage of the track is curved.	Repair / replace
	The tracker roller is worn.	Replace the roller
	The tension of the track is insufficient.	Adjust the tension of the track.
Abnormal pump noise	Clogged filter.	Clean or replace the filter.
	Air drawn in by the pump	Check and repair tubes and seals.
	Worn or damaged pump parts	Repair / replace
Oil leak from hydraulic pump	Loose connector	Tighten
	Damaged seal	Repair / replace
	Loose pump bolts	Tighten
Oil leak from track roller or idler roller.	Damaged seal	Replace
	Damaged idler roller	Replace
The hydraulic oil temperature is too high.	Insufficient quantity of hydraulic oil.	Fill the hydraulic oil to the required level.
	Overload	Reduce the load.
The upper part does not rotate or does not rotate smoothly.	Insufficient quantity of grease.	Check and lubricate.
	Defective rotation motor.	Check and repair
	Defective rotation brake valve.	Check and repair

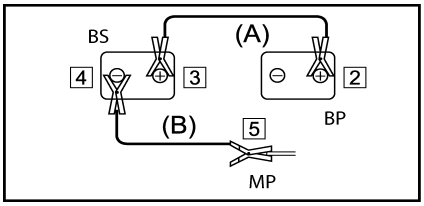
16 IF THE BATTERY IS DISCHARGED

16.1 Precautions for connecting and disconnecting the starter cables

⚠ WARNING

- **When you start the engine using connection cables, wear protective goggles.**
- **If you start the engine by taking electrical power from another machine, check that your machine does not come into contact with the other machine.**
- **To connect the starter cables, start with the positive terminal. To disconnect them, start with the negative terminal (mass).**
- **If a tool comes into contact with the machine's positive terminal, there is a risk of sparks.**
- **Do not connect the connection cables to the terminals in reverse polarity. For example, never connect the negative terminal on one machine to the positive terminal on the other machine.**
- The capacity of the starter cables and the size of the clips must be adapted to the size of the battery.
- Check that there is no damage, cracks or corrosion on the starter cables and clips.
- The machines' batteries must have the same capacity.

16.2 Connecting the starter cables



BS = backup battery

BP = battery broken down

MP = machine engine broken down

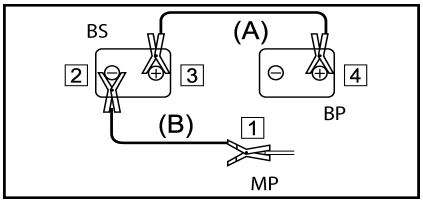
1. Set the start switches on both machines to OFF.
2. Connect the clip of the red starter cable (A) to the positive terminal of the battery on the machine that has broken down.
3. Connect the other clip of the red starter cable (A) to the positive terminal of the battery on the repair machine.
4. Connect the clip of the black starter cable (B) to the negative terminal of the battery on the repairing machine.
5. Connect the other clip of the black starter cable (B) to the engine block of the machine that has broken down.

16.3 Starting the engine

1. Check that the cables are connected safely to the battery terminals.
2. Start the engine on the repair machine and increase the engine speed to maximum.
3. Turn the starter switch of the machine that has broken down to START to start the engine. If the engine does not start, wait at least two minutes before trying again. Do not stop the engine on the repair machine and keep the engine speed at full rate.

16.4 Disconnecting the starter cables

- After starting the engine on the machine that has broken down, disconnect the starter cables in reverse order to the connection procedure.



BS = backup battery

BP = battery broken down

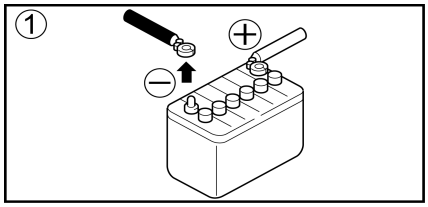
MP = machine engine broken down

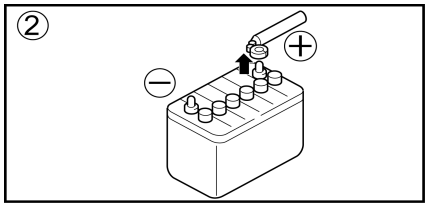
1. Remove the clip of the black starter cable (B) from the engine block of the machine that has broken down.
2. Remove the clip of the black starter cable (B) from the negative terminal of the battery on the repairing machine.
3. Remove the clip of the red starter cable (A) from the positive terminal of the battery on the repairing machine.
4. Remove the clip of the red starter cable (A) from the positive terminal of the battery on machine that has broken down.

16.5 Charging the battery

Disconnecting

- To disconnect, start with the negative terminal. **(-)**





Charging the battery

⚠WARNING

Remove the cables from the positive and negative terminals of the battery before setting the battery to charge. Otherwise, abnormal voltage may be applied to the alternator and may damage it.

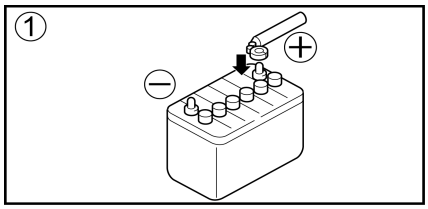
⚠WARNING

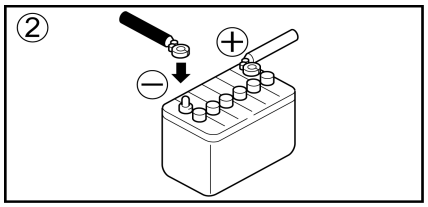
Do not connect the connection cables to the terminals in reverse polarity. For example, never connect the negative terminal on one machine to the positive terminal on the other machine. A polarity reversal may damage the alternator.

- When the battery is charging, remove all the plugs to release the gases generated.
- If the battery overheats (the electrolyte temperature exceeds 45°C), stop the operation.
- Stop the charging operation as soon as the battery is charged. If you continue, the following faults may occur :
  - battery overload
  - reduction in the battery electrolyte
  - battery failure
- The battery must only be handled once the cables have been disconnected (except for checking the level of electrolyte and the specified electrolyte density measurement).

Connecting

- To connect, start with the positive terminal. **(+)**





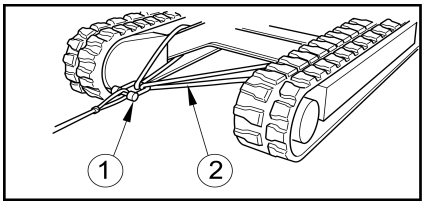
17 TOWING THE MACHINE

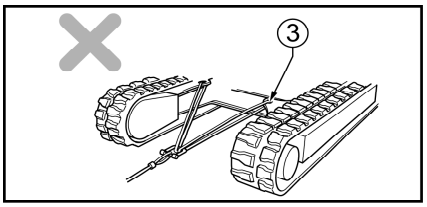
⚠ WARNING

Always tow a machine that has broken down in complete safety by using the suitable tools. An unsuitable procedure may cause serious physical injuries.

⚠ IMPORTANT

Check that the metal cables, the slings and the towing mechanisms to be used are resistant enough and that they are not cracked or broken. Never tow the machine that is only attached to a hook.





- When the machine gets stuck in the mud and cannot get out on its own, or when it is towing a heavy object, attach the sling as shown opposite.

1 = Shackles

2 = Slings

3 = Lifting holes

- Minimum capacities of the coupling devices to use:

	WLL[6] (t)
Shackles	≥5
Slings	≥5

- When towing a machine with another machine, use a metal cable that is powerful enough for the machine's weight.
- Never tow the machine on a slope.
- Never use a deformed or damaged towing cable.
- Do not roll over the towing cable or the metal cable.
- When you hook on an object to be towed, make sure that there is no-one between the machine and the object.

6. Working Load Limit (WLL)

C Periodic maintenance programme

Chapter covered in this part:

1 MAINTENANCE PRECAUTIONS

⚠ CAUTION

No maintenance operations described in this guide are to be performed with the engine running; please refer to the Maintenance Manuel for any other operation.

1.1 Precautions before maintenance

1.1.1 Removing the residual pressure

Before performing any maintenance operation, remove residual pressure in the hydraulic circuit.

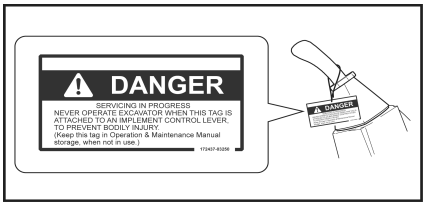
1. Undertake parking operations for the machine on flat and stable ground.
2. Lower the bucket and the blade to the ground.
3. Turn the key to the OFF position to stop the machine's engine, then turn it to the ON position.

   Note

   The locking lever must be lowered.
4. Handle the following controls several times to remove the residual pressure:
   - Left command lever (Arm & Rotation of the upper part)
   - Right command lever (Boom & Bucket)
   - Blade lever
   - 3rd hydraulic circuit control **(P.T.O. 1)**
5. Raise the locking lever(s).
6. Set the starter key to OFF position.
7. Remove the key from the ignition.

The residual pressure in the accumulator is removed and there is no more pressure in the hydraulic circuit.

1.1.2 Place a warning label



⚠ WARNING

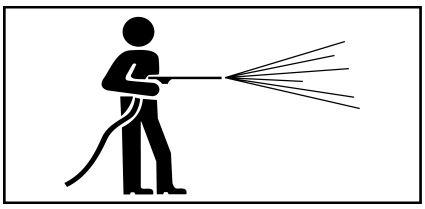
Do not operate the control lever during servicing. Maintenance personnel may be seriously injured.

Place a "MAINTENANCE IN PROGRESS" label on the machine and on the joysticks.

1.1.3 Establish a safety perimeter

- Anyone who is not part of the maintenance team must be kept away from the working area.
- Pay attention to the safety of people nearby, notably during milling or welding operations or when a hammer is used.
- When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

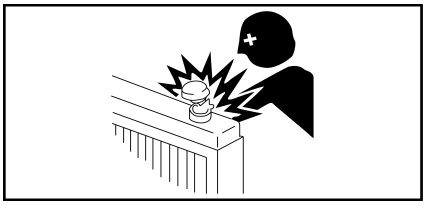
1.1.4 Keep the machine clean



- Cleaning the machine will enable you to detect any leaks and defective parts quickly.
- Especially clean the filler cap, the vent hole and oil level glass gauge and prevent dust from mixing there.
- Spots of oil or grease or dispersed part fragments are dangerous and may cause slipping.
- Any water that gets into the electrical system may cause it to malfunction, leading to defective operation of the machine. This also risks causing short circuits that may cause a fire or electric shock.
- Do not spray any vapour directly onto the sensors or connectors.
- Do not use harsh chemicals to clean the machine, as these affect the visual and technical characteristics of the machine components.These products may also deteriorate the rigidity of the tank.
- Do not spill any water onto the dashboard.
- Do not spray water directly at high pressure onto the radiator or the oil radiator.
- Do not point the pressure washers on the electrical connectors.

1.2 Precautions during maintenance

1.2.1 Oil and grease



- Always use oils and greases recommended by YANMAR.

2 Recommended greases and fluids, page 150

- Use clean oils and greases. Avoid any contamination by dust.

⚠ WARNING

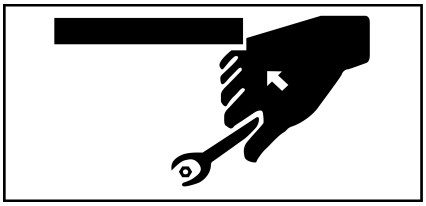
Oil, grease or other fluids may be sprayed when certain parts are maintained.

For maintenance in complete safety, respect to the letter the procedures described in the following chapters.

IMPORTANT

Do not mix different types of oils.If you need to top up the oil with an oil of a different brand or type from the oil left in the tank, remove the remaining oil completely.

1.2.2 Tools



- Use tools that are adapted to the planned task.
- The use of damaged , worn or inappropriate tools is very dangerous and there is a risk that the machine will be damaged.

1.2.3 Parts

- Use YANMAR original parts as recommended in the parts catalogue.
- Clean parts with a non-combustible and non-aggressive detergent.
- If you need to remove a seal or a hydraulic component, refer to the maintenance manual.

1.2.4 Dismantling the accessory

- If the scheduled task requires the dismantling of the accessory, remove it carefully by following the instructions described in this manual.

11.1 Dismantling the accessory, page 121

- Reinstall it carefully and follow the instructions described in this manual.

11.2 Mounting the accessory, page 122

1.2.5 Working under the machine

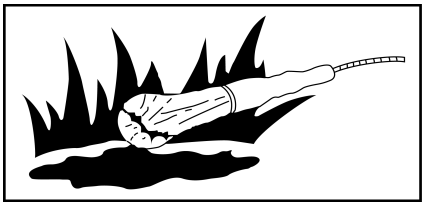
- Before you carry out any maintenance or repairs under the machine, place the accessory on the ground or in its lowest position.

⚠ DANGER

Park the machine on flat, firm ground.

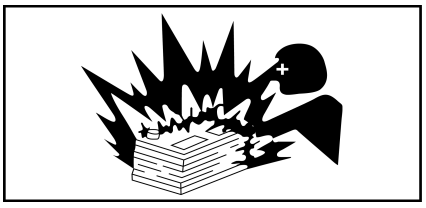
If the machine is not stable, do not carry out any maintenance under the machine.

1.2.6 Lighting



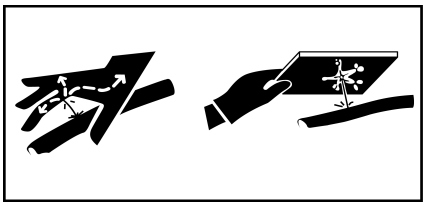
- Use flameproof lighting when checking the fuel, oil, cooling water or battery electrolyte. If you do not, there is a risk of fire and explosion.

1.2.7 Battery



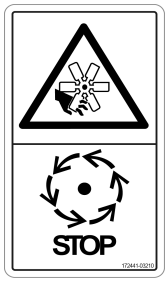
- Disconnect the negative terminal from the battery to disconnect the electric current when working on the electrical circuit (repair, welding).

1.2.8 Hoses



- Do not fold the high pressure hoses. Do not strike them against any hard objects.
- Damaged or incorrectly bent hoses, pipes and ducts explode easily under high pressure ; never re-use them.
- Fuel and oil leaks may cause a fire.
- A pressurized hot oil jet from a minor leak may cause severe injury. Wear protective goggles and gloves when searching for leaks. Use a piece of cardboard or plywood to detect sprays of hot oil.
- In case of contact of hot oil with your body, seek medical treatment immediately.

1.2.9 Radiator ventilator



⚠ WARNING

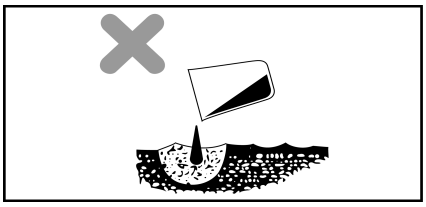
Never touch the moving radiator ventilator or the ventilator belt with an object as this may cause serious physical injuries.

1.2.10 Soldering

If you need to solder, respect the following points :

- Disconnect the battery cabling (negative terminal then positive terminal).
- Ground the machine no more than 1 metre away from the part to be welded.
- Make sure there are no seals or bearings between the soldered part and the earthed part.
- Do not earth near the axes of the equipment or the hydraulic cylinder.

1.2.11 Waste processing



- Do not pour oil down the sewer.
- Always drain the machine's oil into a safe container and never directly onto the ground.
- When you get rid of toxic waste such as fuel, oil, cooling water, solvents, filters and used batteries, respect the regulations that apply to this subject.

2 RECOMMENDED GREASES AND FLUIDS

⚠ IMPORTANT

Grease and fluids must be stored in a location complying with currently enforced regulations and recommendations of the manufacturers of these products.

This machine's engine is fitted with a high accuracy injection system ensuring it complies with regulations on emissions. For the fuel, avoid using galvanised steel containers, but rather containers in plastic or stainless steel. Dissolved zinc or lead in the fuel can alter engine performance.

2.1 Cooling fluid

Temperatures °C								Quantity prescribed (L)
-40	-20	0	20	40	60	80	100	
Long-life cooling fluid **YANMAR POWER COOLANT B-6**								3,4 Radiator 0,4 the expansion flask

To top up:

3.2 Checking and topping up the level of cooling fluid, page 97

2.2 Gear oil

Do not mix different types of oils.If you need to top up the oil with an oil of a different brand or type from the oil left in the tank, remove the remaining oil completely.

Select the viscosity of the oil depending on the room temperature in which the machine will be used.

Temperatures °C							Quantity prescribed (L)
-20	-10	0	10	20	30	40	
75W90LS							0,5 by reducer
80W90LS							

2.3 Engine oil

Do not mix different types of oils.If mixing, the lubricating properties of the oil may be altered. If you need to top up the oil with an oil of a different brand or type from the oil left in the tank, remove the remaining oil completely.

Only use the specified oils. Using other oils may affect the warranty and damage the engine and reduce its life cycle.

Ensure that the oil, the oil cans and the oil filling accessories are not contaminated by impurities or by water.

It is not recommended to use additives.

The engine oil must be changed when the total base number (TBN) becomes less than 2 mgKOH/g. (Test method JIS K-201-5.2-2 (HCI) or ASTM D4739 (HCI))

Use oil which has the same or superior quality than the following classifications:

- API category CD
- ACEA categories E-3, E-4 and E-5
- JASO category DH-1

Select the viscosity of the oil depending on the room temperature in which the machine will be used.

Temperatures °C								Quantity prescribed (L)
-30	-20	-10	0	10	20	30	40	
5W30								3,4
10W30								
15W40								

To top up:

3.3 Checking and topping up the engine oil level, page 98

2.4 Fuel

The fuel used must comply with one of the following standards depending on the geographic zone in which the machine is used:

- No. 2-D, No. 1-D, ASTM D975-94 (United States)
- EN590:96 (European Union)
- ISO 8217 DMX (International)
- BS 2869-A1, BS2869-A2 (United Kingdom)
- JIS K2204 Grade No.2 (Japan)
- KSM-2610 (South Korea)
- GB252 (China)

Additional specifications to respect:

- The cetane number must be 45 or above.
- The quantity of sulphur must not exceed 0.5% in volume. It is preferable to not exceed 0.05%.
- Never mix kerosene, used engine oil or fuel oil with the fuel.
- Water and deposits must not exceed 0.05% in volume.
- Keep the tank clean as well as equipment used to handle fuel.
- Poor quality fuel may reduce engine performance and damage it.
- It is not recommended to use additives. Some additives may reduce the engine's performance.
- The quantity of ash must not exceed 0.01% in volume.
- The quantity of residual carbon must not exceed 0.35% in volume. It is preferable to not exceed 0.1%.
- The quantity of aromatic compounds must not exceed 35% in volume. It is preferable to not exceed 30%.
- The quantity of polycyclic aromatic hydrocarbons must not exceed 10% in volume.
- The quantity of Na, Mg, Si and Al metals must not exceed 1ppm in mass. (Test method JPI-5S-44-95)
- Lubricity: The WS1.4 wear rate measured during the HFRR test must not exceed 460µm.

Select a fuel depending on the room temperature in which the machine will be used.

Temperatures °C							Quantity prescribed (L)
-20	-10	0	10	20	30	40	
No. 1-D / No. 2-D							30,5

To top up:

3.4 Checking and topping up the fuel level, page 99

Biodiesel

In some countries, non-mineral fuels such as rape methyl ester or soybean methyl ester, known by the name of fatty acid methyl ester, are added to mineral fuels.

Biodiesel may be used if it contains a maximum of 7% in volume of fatty acid methyl ester for 93% in volume of mineral fuel (type B7 fuel).

These type B7 fuels must comply with the following standards depending on your location:

- ASTM D-6751 (United States)
- EN14214 (European Union)

Only buy biodiesel from an approved fuel distributor.

Precautions concerning biodiesel:

- The methanol contains in fatty acid methyl esters may lead to corrosion of aluminium or zinc parts.
- The water contained in the fatty acid methyl esters may block the fuel filters and lead to the growth of bacteria.

2.5 Hydraulic oil

Do not mix different types of oils.If you need to top up the oil with an oil of a different brand or type from the oil left in the tank, remove the remaining oil completely.

Select the viscosity of the oil depending on the room temperature in which the machine will be used.

Temperatures °C							Quantity prescribed (L)	
-20	-10	0	10	20	30	40		
VG46							25,0	in the tank
VG68							14,0	the rest

To top up:

3.5 Checking and topping up the hydraulic oil level, page 100

3 PERIODIC INSPECTIONS AND UPKEEPS

Check/Adjust/Supply ◇ Clean □ Oil and grease ■ Replace ● Oil sample ♦ + = and / = or

Check & Service items			Daily	Every 50h	Every 100h	Every 250h	Every 500h *	Every 1000h *	Every 2000h **
General	Missing or broken parts		◇						
	Tightening of nuts and bolts		◇						
	Engine condition, exhaust and inlet hoses		◇						
	Machine overall		□						
	Operation manual			◇(1)			◇	◇	◇
Greasing	Greasing points		■						
	Swing gear and crown			■	■	■	■	■	■
	Bearing rollers and bearings, idler wheels		◇			■(2)	■	■	■
Engine	Diesel filter			●(1)		●	●	●	●
	Water separator	Drain	◇						
		Pre fuel filter				●	●	●	●
		Bowl (if equipped)					□	□	□
	Oil		◇	♦(1)			♦	♦	♦
	Oil filter			●(1)			●	●	●
	Cooling fluid & leakage		◇						●
	Radiator fins		◇+□						
	Belt			◇	◇	◇	◇	◇	●
	Fuel hose, coolant hose								◇/●
	Performance of engine control and engine speed			◇(1)			◇	◇	◇
	Governor lever and accelerator device			◇(1)			◇	◇	◇
	Air cleaner	External air cleaner element	□(3)			●(3)	●	●	●
		Safety cartridge element (if equipped)					●	●	●
	Intake and exhaust valves								◇
	Injectors and injection pressure								□+◇
	Crankcase breather system								◇
	Engine silent-bloc & bracket			◇	◇	◇	◇	◇	◇
Travel	Oil for travel gears			●(1)	◇(2)	◇/●(2)	●	●	●
	Tracks, rubber tracks & pads		◇						
	Track tension		◇						
	Play of travel lever			◇(1)			◇	◇	◇
	Performance of travel			◇(1)			◇	◇	◇
Hydraulic	Oil		◇	♦(1)			♦/●(4)	♦	♦
	Aspiration filter						□/●(4)	□/●(4)	□/●(4)
	Ventilation filter							●	●
	Hydraulic oil return filter			●(1)		●(4)	●	●	●
	Other filter					●(4)	●	●	●
	Accumulator			◇(1)			◇	◇	◇
	Pump pressure			◇(1)			◇	◇	◇
	Play of control lever			◇(1)			◇	◇	◇
	Low pressure			◇(1)			◇	◇	◇
	Blade control			◇(1)			◇	◇	◇
	Boom swing			◇(1)			◇	◇	◇
	Boom			◇(1)			◇	◇	◇
	Arm			◇(1)			◇	◇	◇
	Bucket			◇(1)			◇	◇	◇
	Options			◇(1)			◇	◇	◇
Electric	Time counter		◇	◇	◇	◇	◇	◇	◇
	Wire breakage, short circuits, loosened terminals		◇	◇	◇	◇	◇	◇	◇
	LCD monitor		◇	◇	◇	◇	◇	◇	◇
	Battery			◇(1)			◇	◇	◇
Final	Sign inspection card and return to YANMAR			◇ (1)		◇	◇	◇	◇

* or annualy first time occurs

** or two years

(1) First time 50-80h visit

(2) If machine does lot of digging line during one day (fiber, drop pipe, drainage…).

(3) If machine is used at dusty worksites.

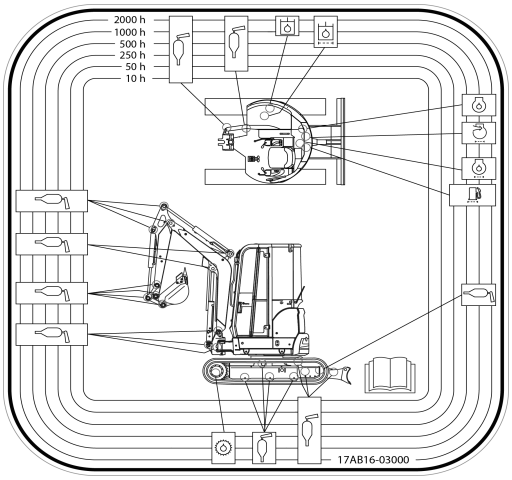
(4) If a hydraulic hammer is used more than 30% of the machine operating time.

♦ Collect oil sample and keep analysis report. According to result replace oil if necessary.

Scheduled maintenance points of the machine (lubrication, filters...)

IMPORTANT

These are frequencies : for example the operations to be carried out every 50 hours must be carried out at 50h, 100h, 150h, 200h, etc.



= Hydraulic oil

= Engine oil

= Hydraulic oil return filter

= Oil for travel gears

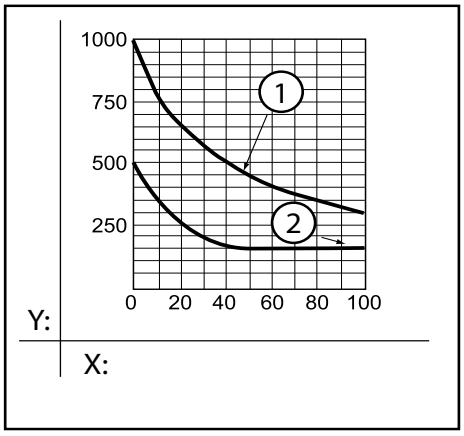
= Greasing points

= Air filter

= Fuel filter

Dependent on technical modifications.

- Certain intervals may vary if a hydraulic hammer is used. Refer to the corresponding notes.



Note

- If a hydraulic hammer is used, the return filter must be replaced after 100 or 150 hours of service for a new machine, then according to the diagram opposite.
- The hydraulic oil must be replaced more frequently if a hydraulic hammer is used. Comply with the diagram opposite.

1 = Hydraulic oil

2 = Hydraulic oil return filter

X = Hydraulic hammer usage rate (%)

Y = Replacement interval (h)

3 Periodic inspections and upkeeps

It is important to entrust the machine to a deal at the intervals indicated so that the dealer can carry out the maintenance operations necessary for the machine to operate correctly.

You should also contact your dealer in the following cases :

- part missing, broken or loose
- horn defective
- time counter defective
- electric circuit defective
- battery defective
- light(s) defective

In general, contact your dealer as soon as you think something is wrong.

4 Maintenance by the operator

4.1 Daily maintenance

4.1.1 Checking the machine before use

Before each use of the machine, visually check the following :

- No missing, broken or loose parts
- Greasing

4.1.3 Greasing points, page 159

- Engine in good condition
- Decanter/separator

4.1.4 Cleaning the separator/decanter, page 160

- Engine oil

3.3 Checking and topping up the engine oil level, page 98

- Cooling fluid

3.2 Checking and topping up the level of cooling fluid, page 97

- Radiator vents

4.1.2 Checking and cleaning the radiator fins, page 158

- Air filter

4.3.6 Air filter cleaning, page 172

- Tracks

4.1.5 Rubber track maintenance, page 161

4.1.6 Steel track maintenance, page 166

- Hydraulic oil

3.5 Checking and topping up the hydraulic oil level, page 100

- Checking the hydraulic hoses
  - Visually check that there are no oil leaks from the hydraulic hose connectors.
- Visual inspection of the fuel hoses
  - Visually check that the fuel does not leak from the fuel hose connectors.
  - Also check that the hoses are not damaged. If there are any faults, contact your dealer.
- Checking the seat
  - Check that the safety belt is present and in good condition.

- Also check that the time counter, the headlights, the alarm and the lights are working correctly.
- Checking the commands

⚠ IMPORTANT
If an element is not working or you think it is defective, shut down the machine's engine immediately and contact your dealer.

– Operate the commands.
– Release the levers, they should return to neutral position themselves.
– If they do not, contact your dealer.

4.1.2 Checking and cleaning the radiator fins

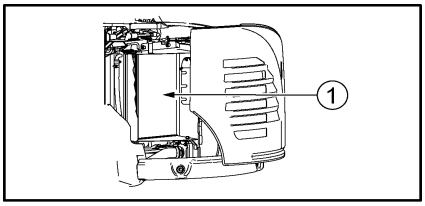
⚠ WARNING
After the machine has stopped, the engine components are hot and may cause burns. Check or clean the radiator fins only after the engine has cooled down.

Before using compressed air, make sure there are no people nearby and wear safety glasses and appropriate clothing.

Do not use compressed air above 0.7 MPa.

⚠ IMPORTANT
Keep a sufficient distance from the radiator when using compressed air to avoid damaging it. A damaged radiator may leak and the machine may overheat.

Dirty fins may cause overheating.

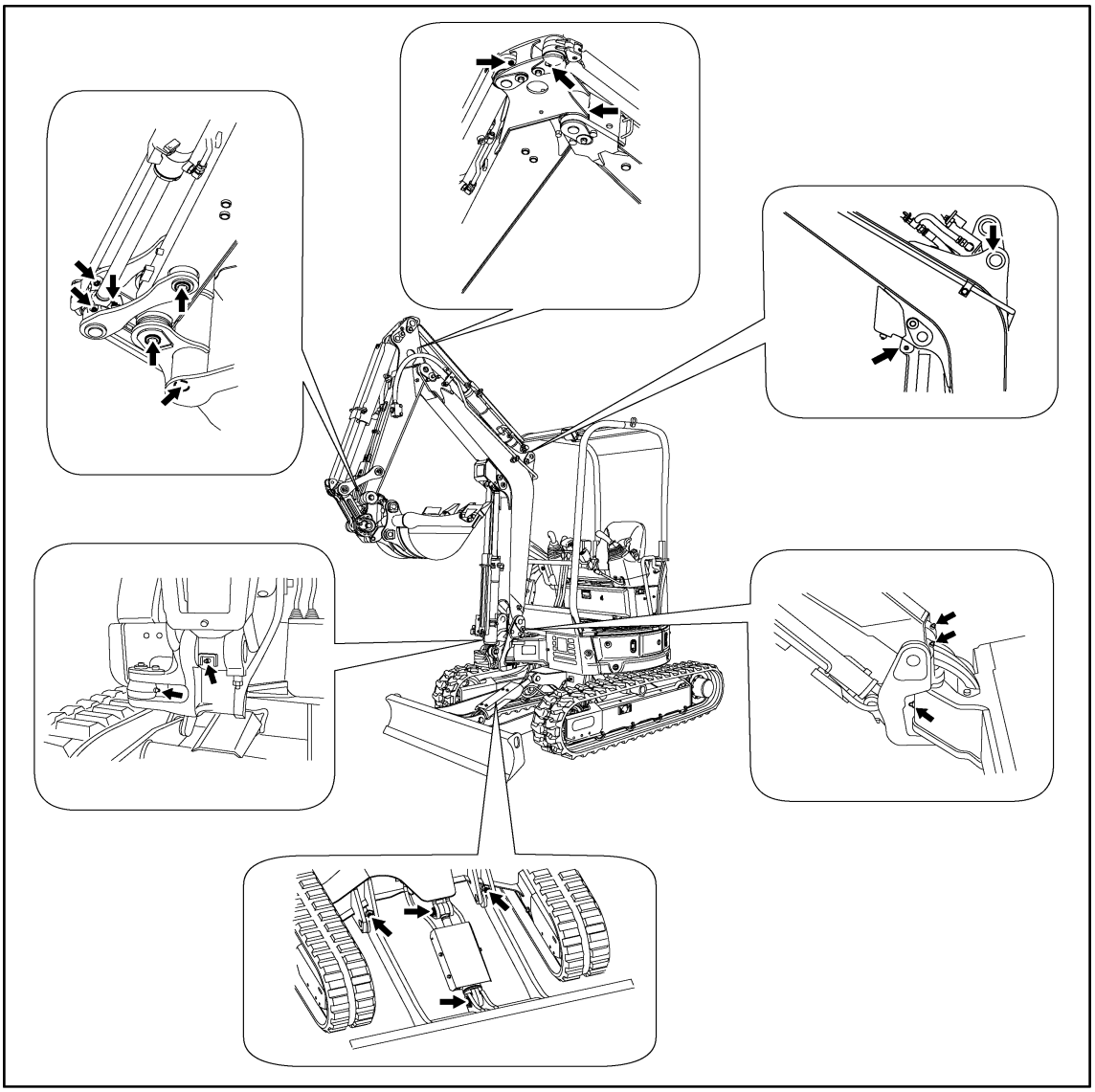


1 = Radiator

1. Open the bonnet. **R.**
2. Use compressed air or a jet of water to remove dust from the radiator fins, oil cooler and fuel cooler.
3. Close the cover.

4.1.3 Greasing points

- Grease the machine swivel pins daily using the nipples, and also before using the machine or after use in the rain, on soft ground or in muddy water.
- Proceed as follows :
  1. Lower the bucket and the blade to the ground.
  2. Stop the engine.
  3. Clean the greasing connectors indicated by the arrows on the figures.
  4. Grease them with a grease pump.
  5. Wipe off the excess grease with a cloth or equivalent.



4.1.4 Cleaning the separator/decanter

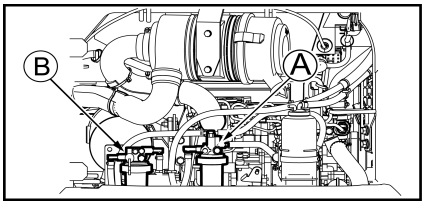
⚠ WARNING

Keep all sparks, flames or cigarettes away.

At operating temperature, the engine components are red hot and may cause burns.

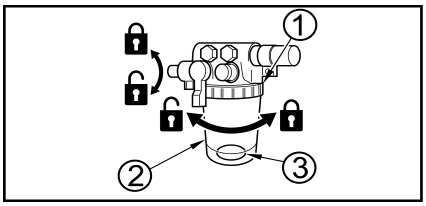
Disconnect the battery mass and clean the separator when the engine has cooled down enough.

A diesel leak or spray onto a red hot element may cause a fire.



A = Fuel filter

B = Decanter/separator



1 = Tightening ring

2 = Bowl

3 = Ring

1. Open the bonnet with the ignition key.
2. Place a container under the separator.
3. Close the fuel inlet tap.
4. Loosen the bowl tightening ring.
5. Remove the bowl.

   Note

   Remove the bowl carefully to avoid spilling any fuel. If you spill any fuel, wipe it up with a cloth.
6. Empty into the container. Take care not to lose the ring.
7. Remove the filter and replace with a new filter.
8. Clean the ring and the inside of the bowl with clean fuel or a cleaning agent.
9. Check that the o-ring is not damaged or deformed. Replace it if necessary.
10. Refit the element and the bowl.
11. Open the fuel inlet tap.
12. Close the engine bonnet.

4.1.5 Rubber track maintenance

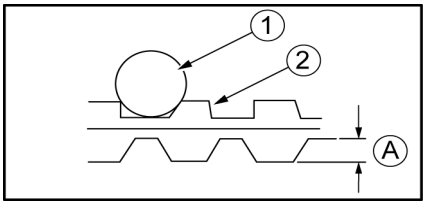
a. Checking the condition of the tracks

- The wear to the rubber tracks depends on the working conditions and the nature of the ground. Regularly check the wear and tension of the tracks.

Note

A new track must be checked for the first time after 30 hours.

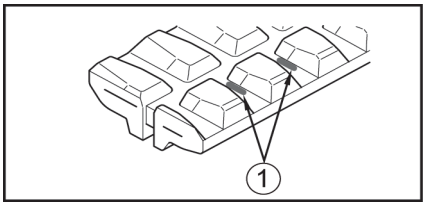
Height of the fixing nuts



- If height A is reduced by wear, the traction power reduces.
- If A is lower than or equal to 5 mm, replace the track.

1 = Track roller

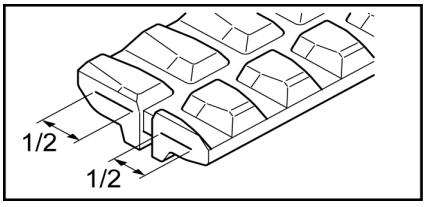
2 = Track



- If the track steel cables are uncovered over two or more joints, replace the tracks.
- If two or more links in the steel cable inside the track are exposed due to wear on the feet, replace the track.

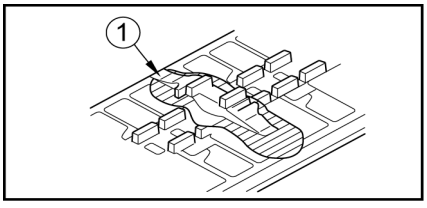
1 = Exposed steel cables

Steel cables for the rubber tracks



- If half or more of the cable bed is broken, replace the track.

Metal insert



- If the metal inserts detach even at a single place, replace the track.

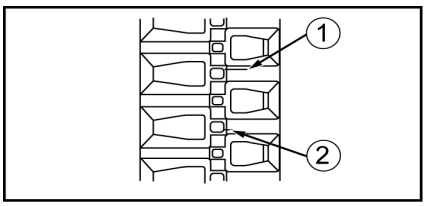
1 = Detachment of the metal insert

Greaser

- If the tracks are relaxed even after adjusting the tension, the lubrication nipple may have an internal failure. Contact your dealer for repair.

4 Maintenance by the operator

Crack



1 = Repair if over 60 mm

2 = Not yet to be repaired

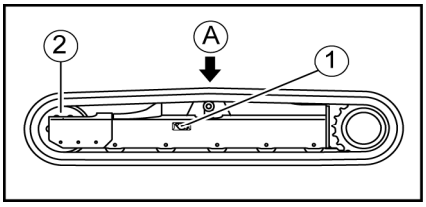
- If a crack appears between the track attachment inserts, repair it if the length of the crack reaches 60 mm. If the interior steel cable is exposed, repair the track immediately even if the crack is a small one.
- If the length of the crack is less than 30 mm or if the depth of the crack is less than 10 mm, you do not need to repair the track.

- To find out whether the track must be replaced, repaired or you can continue to use it, contact your YANMAR dealer.

b. Track replacement

- If a track (or both tracks) needs to be replaced, contact your dealer.
- A new track must be checked for the first time after 30 hours.

c. Tension check

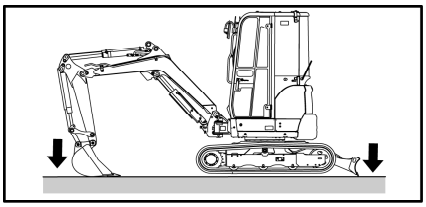


1. Move the machine so that the seal on the internal surface of the track is placed in the centre of the upper chassis.

A = Mark ⌀ inside the track

1 = Cover

2 = Idle wheel



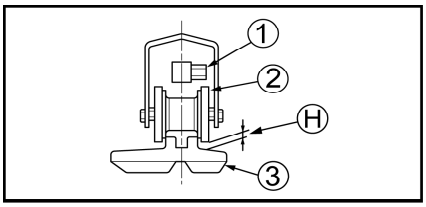
2. Raise the machine with the equipment by activating the command lever.

⚠ WARNING

Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.



3. Check the tension. The play H between the external rolling surface of the second track roller on the tightener roller and the internal surface of the track must be 20 ~ 2522 ~ 28 mm.

1 = Greaser

2 = Track roller

3 = Track

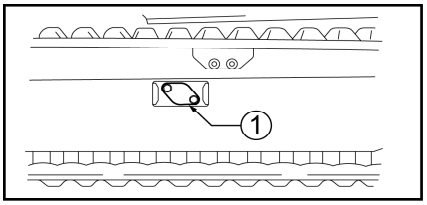
- If the tension is incorrect, follow the procedures given in the following chapters to increase or release the track tension.

IMPORTANT

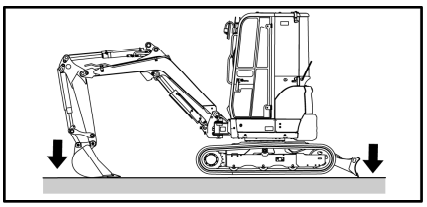
Perform a task with a relaxed track link may derail the track or cause premature wear of the undercarriage.

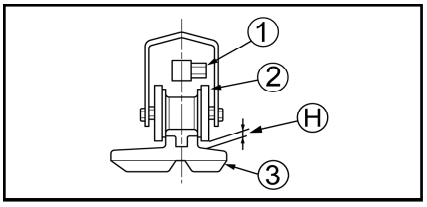
4 Maintenance by the operator

d. Increasing the tension



1 = Cover

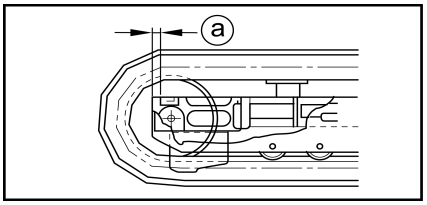




1 = Greaser

2 = Track roller

3 = Track



1. Prepare a grease pump.
2. Loosen the two screws and rotate the bottom cover to access the lubrication nipple.
3. Raise the machine with the equipment by activating the command lever.

⚠ WARNING

Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

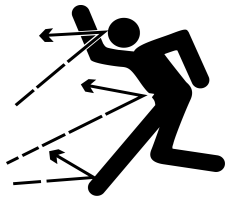
When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.

4. Using the grease pump, inject grease with the greaser so that the play H is between 22 ~ 28 mm.
5. Proceed with the track tensioning.To check that the tension is correct, put the machine down and move it gently forwards and backwards.
6. Check the tension again. If it is still not correct, adjust it again.
7. Re-install the cover.

- The tension may be adjusted until the distance "a" is reduced to 0. If the tension is still insufficient, the track must be replaced due to excessive wear. Contact your dealer for repair.
- If the tension is weak, even after grease is injected, the track must be replaced or a system tension check must be performed. Contact your dealer.

e. Releasing the tension

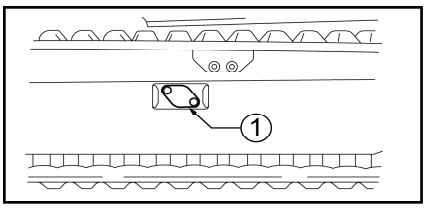


⚠ WARNING
Do not loosen the greaser by more than one turn.

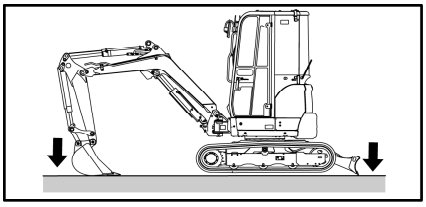
If it is loosened suddenly, the high pressure grease inside may escape or the valve may be ejected, which may cause serious injuries.

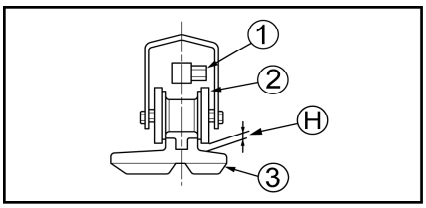
When you check whether the grease has escaped, do not look inside the greaser but check that the track is released. Do not place your face, hand, legs or body in the direction of the greaser.

It is very dangerous to remove the grease using procedures other than those described here. If the track cannot be relaxed, ask your YANMAR dealer to intervene.



1 = Cover





1 = Greaser

2 = Track roller

3 = Track

1. Loosen the two screws and rotate the bottom cover to access the lubrication nipple.
2. Raise the machine with the equipment by activating the command lever.

⚠ WARNING
Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.

3. Loosen the greaser.
4. Let the grease escape so that the track will extend.
5. Tighten the greaser.

Tightening torque : 49,0 N•m.

6. Proceed with the track tensioning.
7. Check the tension again. If it is still not correct, adjust it again.
8. Wipe off the excess grease with a cloth or equivalent.
9. Re-install the cover.

⚠ IMPORTANT
The rubber track does not resist grease. Wipe the grease off completely as it may reduce the life time of the rubber tracks.

4.1.6 Steel track maintenance

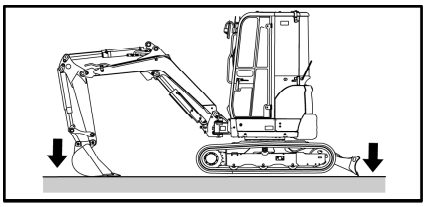
a. Checking the condition of the tracks

- The wear to the track pins and pegs depends on the working conditions and the nature of the ground. Check the track tension regularly to maintain suitable tension.
- Check and adjust the track tension under the same conditions as the operating conditions (for example, muddy conditions if the task is carried out on muddy ground).
- To find out whether the track must be replaced, repaired or you can continue to use it, contact your YANMAR dealer.

b. Track replacement

- If a track (or both tracks) needs to be replaced, contact your dealer.

c. Tension check



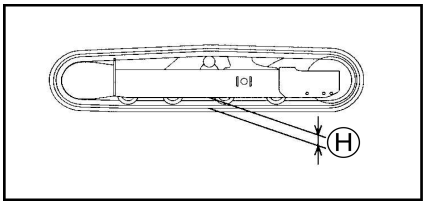
1. Raise the machine with the equipment by activating the command lever.

⚠ WARNING

Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.



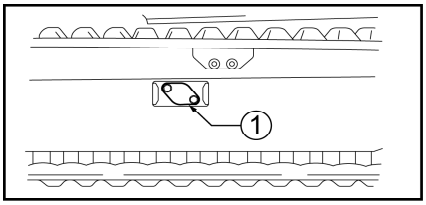
2. Check the tension. The gap between the lower part of the lower chassis and the internal surface of the track must be 105 ~ 115 mm.

3. If the tension is incorrect, follow the procedures given in the following chapters to increase or release the track tension.

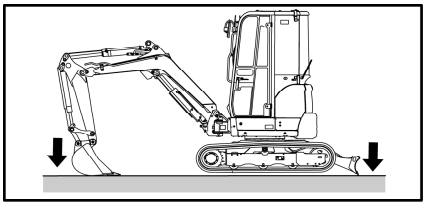
IMPORTANT

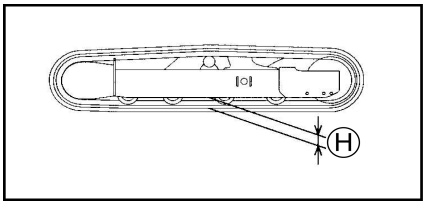
Perform a task with a relaxed track link may derail the track or cause premature wear of the undercarriage.

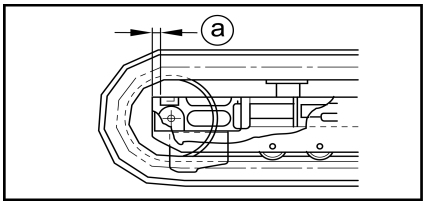
d. Increasing the tension



1 = Cover







1. Prepare a grease pump.
2. Loosen the two screws and rotate the bottom cover to access the lubrication nipple.
3. Raise the machine with the equipment by activating the command lever.

⚠ WARNING

Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.

4. Using the grease pump, inject grease with the greaser so that the play H is between 105 ~ 115 mm.
5. To check that the tension is correct, put the machine down and move it gently forwards and backwards.
6. Check the tension again. If it is still not correct, adjust it again.
7. Re-install the cover.

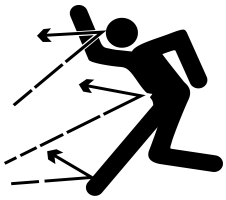
Note

The tension may be adjusted until the distance "a" is reduced to 0. If the tension is insufficient after being adjusted, the pin and the peg must be replaced. Contact your dealer for repair.

Note

If the tension is weak even after grease is injected, the track must be replaced. Contact your dealer.

e. Releasing the tension

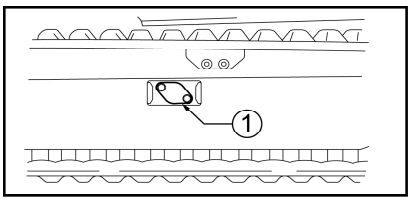


⚠ WARNING
Do not loosen the greaser by more than one turn.

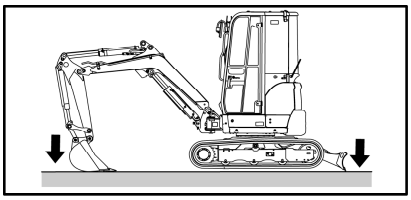
If it is loosened suddenly, the high pressure grease inside may escape or the valve may be ejected, which may cause serious injuries.

When you check whether the grease has escaped, do not look inside the greaser but check that the track is released. Do not place your face, hand, legs or body in the direction of the greaser.

It is very dangerous to remove the grease using procedures other than those described here. If the track cannot be relaxed, ask your YANMAR dealer to intervene.



1 = Cover



1. Loosen the two screws and rotate the bottom cover to access the lubrication nipple.
2. Raise the machine with the equipment by activating the command lever.

⚠ WARNING
Do not support the machine with the accessory only. The command levers may move or hydraulic oil may spill accidentally and cause the machine to fall.

When the machine is checked or adjusted by two people, one of them must commission the machine according to the signals given by the other person.

Be sure to perform the track tension verification on a firm and even surface. It is strictly forbidden to be positioned under the machine for the duration of the operation.

3. Loosen the greaser.
4. Let the grease escape so that the track will extend.
5. Tighten the greaser.

Tightening torque : 49,0 N•m.

6. To check that the tension is correct, put the machine down and move it gently forwards and backwards.
7. Check the tension again. If it is still not correct, adjust it again.
8. Wipe off the excess grease with a cloth or equivalent.
9. Re-install the cover.

4.1.7 Checks after using the machine

After each use, several checks must be carried out according to how the machine is used ; refer to chapter :

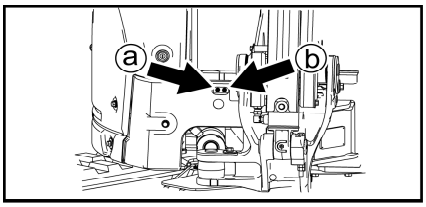
5 Checks after use, page 103

4.2 Maintenance every 50 hours

4.2.1 Greasing the pin and rotation crown

⚠ WARNING

Do not pivot the upper structure during greasing. Grease and pivot alternately to avoid any injury.



- Using a grease pump, grease the pin and the rotation crown at the greasers indicated with arrows on the figure opposite.

a = Rotation crown

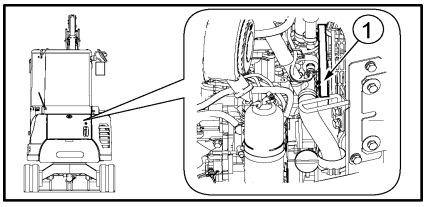
b = Pin

- Slowly pivot the upper structure until it has made one complete turn.

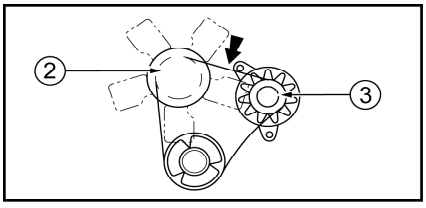
4.2.2 Checking alternator belt tension

⚠ WARNING

After the machine has stopped, the engine components are hot and may cause burns. Check the tension of the belt once the engine parts have completely cooled.



1 = Alternator belt



2 = Fan pulley

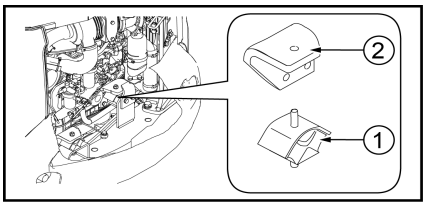
3 = Alternator pulley

1. Open the bonnet with the ignition key.
2. Check the belt tension by pressing the section of the belt between the fan pulley and the alternator pulley with your finger.

   Compressive force: approximately 10 kgf

   Correct range of travel: 10-15 mm
3. Check that the pulleys, the V-groove, and the fan belt are not damaged, and check that the fan belt is not touching the lower part of the V-groove.
4. If the belt or pulleys are damaged or the belt is loose, contact your dealer.
5. Close the engine bonnet.

4.2.3 Engine silent-bloc & bracket



1 = Silent-bloc

2 = Bracket

- Check the condition of the silent blocks and their supports.

4.3 Non periodic maintenance

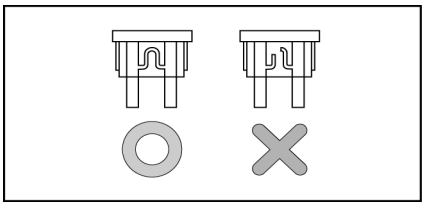
4.3.1 Fuse replacement

IMPORTANT

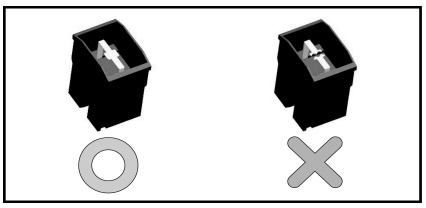
An unsuitable fuse or a fuse holder with a short circuit may cause overheating and damage the electrical circuit or the electrical components.

1. Set the starter key to OFF position.
2. Remove the lid from the fusebox.
3. Identify the burnt out fuse.
4. Replace it with an equivalent fuse.

Fuse strip

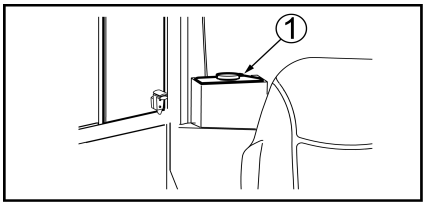


General supply fuses



- If a fuse burns out immediately after it is replaced, this means there is a problem in the electric circuit. Contact your dealer for a diagnostic and an intervention.

4.3.2 Top up the windscreen washer fluid (for cab)



1 = Windscreen washer tank

⚠ **IMPORTANT**
Do not let any impurities into the tank.

1. Open the windscreen washer tank.
2. Top up the windscreen washer fluid. Do not over fill the windscreen washer tank.

4.3.3 Replacing the windscreen wiper (for cab)

- Replace the windscreen wiper when it no longer cleans the windscreen correctly. Follow the procedure indicated by the windscreen wiper manufacturer.

4.3.4 Accessory state check

- When working on an accessory, please contact your dealer or refer to the manufacturer user manual supplied with the accessory.

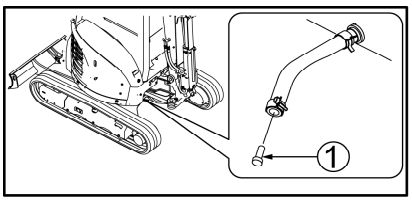
4.3.5 Purging the fuel tank

⚠ DANGER

Keep all sparks, flames or cigarettes away.

⚠ WARNING

Ensure the fuel does not enter contact with your body.



1 = Drain plug

1. Pivot the upper structure so that the drainage cap is opposite the blade between the two tracks.
2. Remove the hose from its housing.
3. Place a container to catch the fuel residue under the hose.
4. Remove the drainage cap to purge the water and dirt left in the tank.
5. As soon as clean fuel starts coming out, put the drainage cap back on firmly.

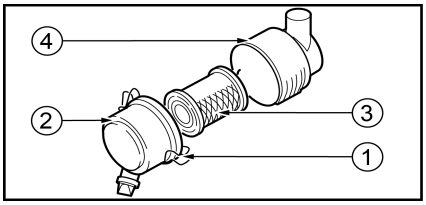
4.3.6 Air filter cleaning

⚠ WARNING

Do not clean or change the air filter if the engine is not stopped.Wait until the engine has cooled down.

Compressed air is used to clean the air filter. Wear protective goggles to prevent eye injury.

When cleaning, the compressed air pressure must be below 0.5 MPa.

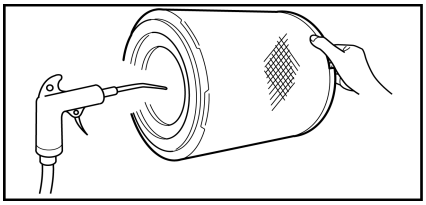


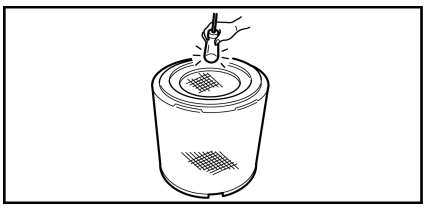
1 = Fastener

2 = Air filter cover

3 = Filter

4 = Air filter body





1. Open the bonnet with the ignition key.
2. Release the fasteners to remove the air filter lid.
3. Clean the air filter cover.
4. Remove the filter.
5. Clean inside the air filter body.
6. Remove dirt by blowing dry compressed air inside the filter, along the folds.
7. Then blow dry compressed air outside the filter.
8. Blow dry compressed air again inside the filter to finish cleaning.
9. After cleaning, check filter integrity using a lamp. Change the filter if you notice holes or worn zones.

⚠ IMPORTANT

Do not hit the filter against other objects when you clean it, as this would damage it.

Do not reuse the filter if damaged.

Store spare filters in clean paper and in a dry location.

10. Reposition the clean filter.
11. Close the filter with its cover while turning it in the direction shown by an arrow on the cover.
12. Close the cover.

5 MAINTENANCE BY THE DEALER

5.1 After the first 50 hours of service

- Checks carried out by the dealer:
  - – User manual available and in good condition
  - – Engine — Alternator belt : Tension check
    Performance of engine control and engine speed
    Governor lever and accelerator device
    Engine silent-bloc & bracket
  - – Travel levers : Play of travel lever
  - – Travel : Performance of travel
  - – Command lever : Play of control lever
  - – Hydraulic — Accumulator
    Pump pressure
    Low pressure
  - – Equipment — Blade
    Boom swing
    Arm
    Boom
    Bucket
    Options
  - – Electrical equipment — Time counter
    Wire breakage, short circuits, loosened terminals
    Operator display station
    Battery

- Servicing carried out by the dealer:
  - – Swing gear and crown : Greasing
  - – Diesel filter: Replacing the element
  - – Engine oil : Oil sample
  - – Engine oil : Replacing the element
  - – Travel gears : Oil replacement
  - – Hydraulic oil : Oil sample
  - – Hydraulic oil return filter : Replacing the element

- Sign inspection card and return to YANMAR

D Conservation and storage

Chapter covered in this part:

IMPORTANT

The conservation and storage of the machine must comply with standard NF ISO 6749 " Earth moving equipment, conservation and storage ". The following chapters take part of the standard mentioned above but are not exhaustive. Refer to the standard for any additional information.

1 CONSERVATION

- Placing in conservation is intended to ensure the protection of the machine against corrosion from the environment and against minor damage that may occur during handling, transport and storage.
- Return the machine to good condition before placing it in conservation.

1. Clean all the parts.
2. Apply rust remover and paint to metal components the paintwork of which is damaged.
3. Apply greasing oil and grease to the machine's metal surfaces and replace the engine oil.
4. Apply grease to the exposed parts of the cylinder rods.
5. To avoid condensation in the fuel tank, drain the tank or fill it up.
6. The battery must be disconnected. If the storage period exceeds one month, the battery must be removed and stored in a special room.
7. Make sure the liquid in the cooling system has sufficient performance characteristics and is appropriate for the machine's storage temperatures.

2 Recommended greases and fluids, page 150

If necessary, top up the water.

3.2 Checking and topping up the level of cooling fluid, page 97

⚠ WARNING

Do not open the bonnet during machine operation. Verification and topping up of the various levels should be done when the engine is stopped and the temperatures are brought back down.

8. Lock the joysticks and pedals using locking levers and pedal protectors.

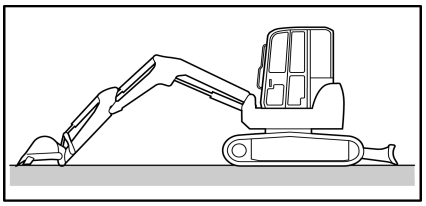
Note

The machine rusts easily if it is left near the sea or in a place exposed to sea winds. Apply rust protector to all the exposed parts of the piston rods and cover the machine with a polyethylene sheet or oiled paper. Certain rust protection solvents dammage rubber materials. Make sure you use an adapted rust protector.

⚠ WARNING

When you place the machine in an enclosed space, ventilate by opening the doors and windows to avoid any gas intoxication.

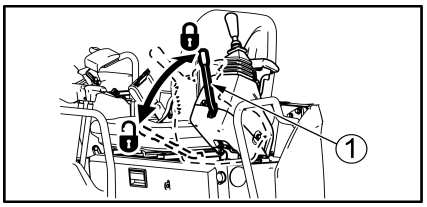
2 STORAGE



- You are recommended to store the machine in a closed and covered location.
- If the machine is stored outdoors, park it on flat ground and cover it with a protective sheet.
- The machine must be placed in the position illustrated opposite to protect the hydraulic cylinder rods against corrosion.
- In a long-term storage, move the machine at least once a month to form new oil on all the moving parts and remove the battery.

⚠ WARNING
Before using the machine indoors, ensure the area is ventilated properly by opening the windows and doors.

- When you do not use the machine for a period of over 2 months, avoid placing the tracks in a place that is directly exposed to sunlight or rain.
- The conservation and recommissioning instructions, as well as the conservation date must be placed in an impermeable envelope with a label and secured to the machine at a visible location.
- To protect the machine against rainwater, trap it to avoid accumulation of water that can promote corrosion of metal parts.



- The locking lever(s) must be in locked in a position to avoid any possibility of the machine being activated accidentally.

1 = Locking lever

- The machine in prolonged storage must be regularly inspected in terms of its external appearance, the condition of the protected surfaces and the protection materials. The inspection intervals are the following :
  - every 6 months under temperate weather conditions,
  - every 3 months under tropical, cold, Arctica or coastal weather conditions.

3 RECOMMISSIONING

⚠ WARNING

After storage of the machine at temperatures outside the machine's operating temperature range, make sure the temperature is again in the operating temperature range before restoring the machine to working order.

Before using the machine again after a storage period of two months, do the following:

1. Clean the machine.
2. Check the global aspect of the machine.
3. Remove the protective grease from the cylinder rods.
4. Apply a large quantity of oil or grease to the moving part.
5. Drain the water from the fuel tank, from the engine oil casing and from the hydraulic fluid tank by removing the drainage caps.
6. Leave the machine to warm up after you start the engine.

E Technical data

Chapter covered in this part:

1 SPECIFICATIONS

Tracks		Rubber / Steel	
H (track tension)	mm	22 ~ 28 / 105 ~ 11520 ~ 25 / 105 ~ 115	
Elements		Canopy	Cabin

Weight (in conformity with European standards)

Weight of the machine (with operator +75 kg)	kg	2665 / 2775	2770 / 2880

Working range and performance

Operating temperature range	°C	-15 ~ 40	
Bucket capacity, standard	m³	0,06	
Bucket width, standard	mm	415	
Boom rotation angle : left / right		47° / 74°	
Maximum excavation force : bucket / arm	kN	23,1 / 14,4	
Travel Speed : high/ low	km / h	4,5 / 2,8	
Maximum slope		25°	
Rotation speed	rpm	10	
Average pressure on the ground, standard track	kg / cm²	0,30 / 0,31	0,31 / 0,33
Hydraulic pump rate	L / min	**P1–P2:** 30,0 <variable rate pump> **P3:** 21,3 <geared pump> **P4:** 11,3 <Trochoid pump>	
Maximum hydraulic circuit pressure	MPa	**P1–P2:** 20,6 **P3:** 18,1 **P4:** 2,9	

Engine : YANMAR 3TNV76-NBVA1

Type	3 cylinders ; water cooling ; direct Diesel injection	
Power / revs	kW / rpm	15,2 / 2500
Alternator capacity	V / A	12 /40
Battery	V / Ah	12 / 45
CO_2 emissions	g / kWh	932[7]
Test cycle		NRSC

Dependent on technical modifications.

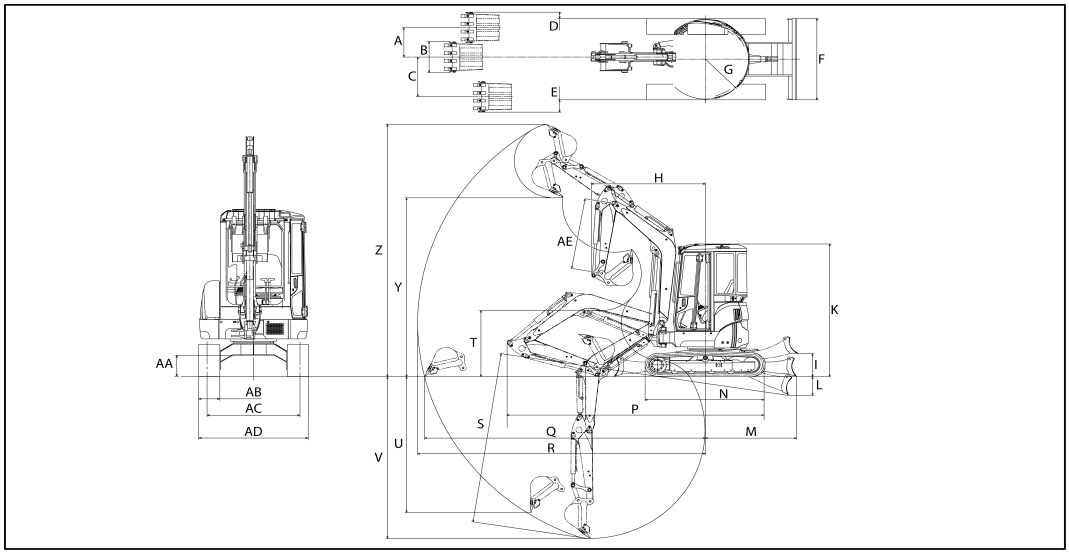
7. This CO_2 measurement is the result of tests, carried out in laboratory conditions on a fixed cycle, on a parent engine, representative of a family of engines, and may in no way be considered as an indication or a guarantee of the performance of any particular engine.

2 WORKING DIMENSIONS

⚠ WARNING

The working dimensions are indicated for a machine equipped with the standard bucket defined in the table of machine specifications.

The dimensions of the additional accessories and equipment installed on the machine may modify the working dimensions, and must therefore be taken into account before using the machine.



Unit : mm		L++			L++
A	485		Q	4340	4590
B	415		R	4460	4700
C	705		S	2690	2940
D	2		T	1000	760
E	110		U	1150	1290
F	1500		V	2490	2740
G	750		Y	2830	2985
H <swing>	1950 <1650>	1990 <1680>	Z	3990	4140
I	340		AA	320	
K Cabin / Canopy	2530 / 2520		AB	250	
L	355		AC	1250	
M	1380		AD	1500	
N	2040		AE	1150	1400
P	4110	4120			

3 NOISE EMITTED BY THE MACHINE

Examination results :

LwA (dBA)	93
LpA/LAeq (dBA)	80
LpCrête (dBC)	119

Rounded values

LwA : weighted acoustic power level A.

LpA/LAeq : weighted acoustic pressure level A on operator's ears.

LpCrête : maximum value of the instant acoustic pressure measured with frequency weighting C.

Measurements carried out :

- machine in static position
- machine running at nominal power

LwA : determined and guaranteed according to Directive 2000/14/CE amended by Directive 2005/88/CE.

LpA/LAeq : measured and guaranteed according to standard NF-ISO 6396: 2008.

These values are declared in accordance with Directive 2006/42/CE and do not correspond to exposure values over 8h of work.

4 VIBRATIONS EMITTED BY THE MACHINE

Declared vibration value in accordance with EN 12096			Unit : m/s²
Vibrations	Work cycle	Measured vibration emission value, a	Uncertainty, K
Hand-arm in m/s²	Roadworks trench	< 2,5	–
	Levelling	< 2,5	–
	Displacement	< 2,5	–
	Hydraulic hammer	< 2,5	–
Full body in m/s²	Roadworks trench	< 0,5	–
	Levelling	0,79	0,16
	Displacement	0,89	0,17
	Hydraulic hammer	< 0,5	–
Values determined in accordance with standards ISO 5349-2 & NF EN 1032			

Work cycle	Work cycle definition
Roadworks trench	So called excavation work; bucket movements digging in the soil (packed earth).
Levelling	Advance with blade in the down position and move backward with blade raised; on packed earth.
Displacement	Loop circuits on the gravel storage area (approximate speed 4km/h - 2.6 mi/h) clockwise turn.
Hydraulic hammer	Operation of hydraulic rock breaker for 20 seconds on a steel plate of 100x50x5cm placed on the ground.

Note

These values are declared in accordance with Directive 2006/42/CE and do not correspond to exposure values over 8h of work.

The following provisions should be taken in order to transmit the minimum amount of vibration to the whole body while the machine is operating and to avoid damaging the operator's health :

- Adjust the seat according to the operator's size.
- Keep the terrain in good condition.
- Use the machine under the conditions provided for, taking account of the real conditions of the terrain and the specific effects of the vibration that results from the actual operation of the machine.

The user must read and keep the instructions related to mounting and using accessories.

F Lifting capacities

CHAPTER COVERED IN THIS PART:

⚠ IMPORTANT

Using the machine as a hoist is subject to the Machinery Directive 2006/42/EC for members of the European Community, and to the legislations specific to each country for states outside the EC.

⚠ IMPORTANT

The capacities indicated in the following tables are determined for flat, firm ground. When the machine is not used on this type of ground, you should take account of these new conditions.

The machine's maximum weight allowed for dynamic operating conditions is determined by the most unfavourable cylinder extension and positioning conditions for the machine.

Depending on the machine configuration (arm length, presence of a counterweight...) and working conditions, the operator must make sure that: the total weight of the quick hitch, the accessories used (bucket, hydraulic hammer...) and the load handled does not exceed the maximum weight allowed.

9.1 Machine stability when using with a bucket or an accessory, page 113

⚠ IMPORTANT

The data in these tables represent the lifting capacity according to standard ISO 10567. They correspond to 75 % of the maximum static load before tipping or to 87 % of the hydraulic lifting force. The data marked with * show the hydraulic limits of the lifting force.

YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S. declines all responsibility for any use of the machine that does not respect the instructions in this regulation.

⚠ IMPORTANT

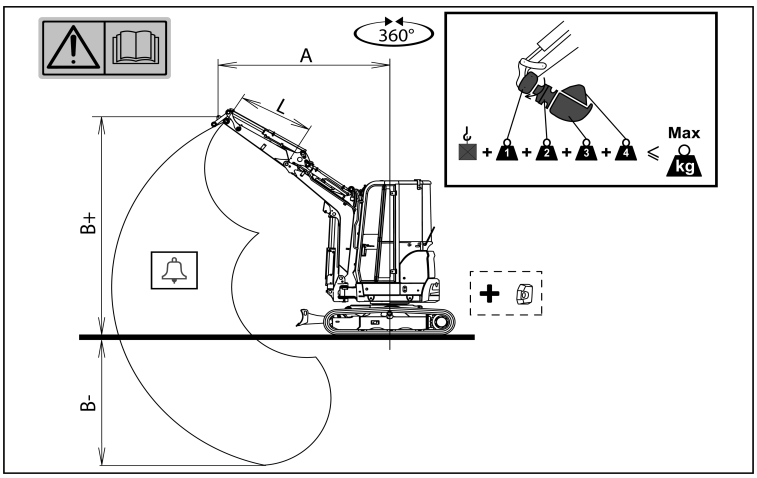
The position of the blade (raised or lowered) does not affect the machine's lifting capacity.

The lifting table indicates the maximum value which can be lifted by the machine through a complete rotation of the turret.

⚠ IMPORTANT

The machine's lifting capacity tables were generated using the ring welded to the tie rod of the machine.
YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S cannot guarantee proper machine operation or operator safety when lifting operations are performed using lifting points located on the accessory.

1 LIFTING VIO27-6 CABIN



Machine with cab and rubber tracks.
A = Tilt from the rotation axis
B = Attachment point height
= Housing overload alarm value setting
* = Hydraulic capacity limits of the lifting force

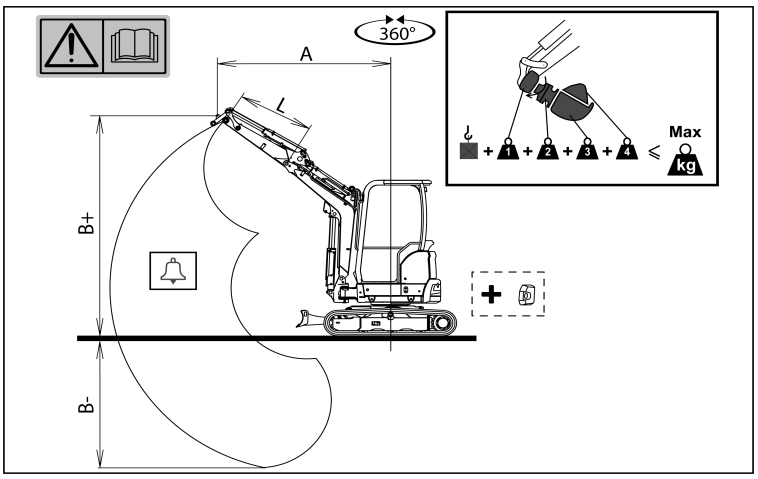
L = 1150mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	*525	*525	-	-	-	-
2.5m	400	*495	-	-	-	-
2m	350	*525	*550	-	-	-
1m	310	450	600	830	-	-
0m	310	420	525	750	-	-
-1m	380	410	530	730	-	-
-1.5m	500	-	540	740	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L=1400mm						
B \ A	Max	3m	2.5m	2.5m	-	-
3m	390	-	-	-	-	-
2.5m	340	410	-	-	-	-
2m	310	380	-	-	-	-
1m	280	310	*760	-	-	-
0m	280	420	540	730	-	-
-1m	330	400	530	740	-	-
-1.5m	410	-	540	720	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L = 1150mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	*525	*525	-	-	-	-
2.5m	420	*495	-	-	-	-
2m	385	*525	*550	-	-	-
1m	345	495	655	880	-	-
0m	345	465	590	790	-	-
-1m	425	455	585	810	-	-
-1.5m	550	-	595	820	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L=1400mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	430	-	-	-	-	-
2.5m	375	455	-	-	-	-
2m	345	425	-	-	-	-
1m	315	355	*760	-	-	-
0m	315	465	595	800	-	-
-1m	375	445	585	820	-	-
-1.5m	460	-	595	800	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

2 LIFTING VIO27-6 CANOPY



Machine with canopy and rubber tracks.
A = Tilt from the rotation axis
B = Attachment point height
= Housing overload alarm value setting
* = Hydraulic capacity limits of the lifting force

L = 1150mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	*525	*525	-	-	-	-
2.5m	390	*495	-	-	-	-
2m	340	*525	*550	-	-	-
1m	300	430	570	790	-	-
0m	300	400	495	710	-	-
-1m	370	390	500	690	-	-
-1.5m	490	-	510	700	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L=1400mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	380	-	-	-	-	-
2.5m	330	390	-	-	-	-
2m	300	360	-	-	-	-
1m	270	290	*760	-	-	-
0m	270	400	510	690	-	-
-1m	320	380	500	700	-	-
-1.5m	400	-	510	680	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L = 1150mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	*525	*525	-	-	-	-
2.5m	425	*495	-	-	-	-
2m	375	*525	*550	-	-	-
1m	335	475	625	870	-	-
0m	335	445	560	790	-	-
-1m	415	435	555	770	-	-
-1.5m	540	-	565	780	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

L=1400mm						
B \ A	Max	3m	2.5m	2m	-	-
3m	420	-	-	-	-	-
2.5m	365	435	-	-	-	-
2m	335	405	-	-	-	-
1m	305	335	*760	-	-	-
0m	305	445	565	770	-	-
-1m	365	425	555	780	-	-
-1.5m	450	-	565	760	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Appendices

Additional informations:

A Notes
B Lashing record

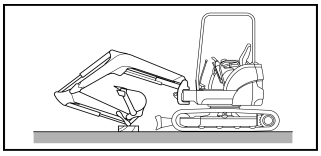
A Notes

B Lashing record

YANMAR CONSTRUCTION EQUIPMENT EUROPE S.A.S
25, rue de la Tambourine
52100 SAINT-DIZIER CEDEX FRANCE
+ 33 (0) 3 25 56 39 75

GENERAL PRINCIPLE OF APPLICATION

Road transport | Model : ViO27–6 | Type of operation: Tie-down



Activity:	Earthmover
Group:	Excavator
Subgroup:	Tracked excavator
Category:	Mini tracked excavator
Size:	L.= 4110 mm / l.= 1500 mm / H.= 2530 mm

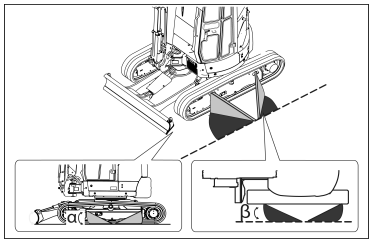
⚠ WARNING

Do not perform the tie-down if a person stands on the machine or on an accessory.

Use a tie-down accessory (belt, chain, cable) compatible with the weight of the machine and compliant with European standards.

The tie-down process is defined based on the characteristics of a trailer with a Maximum Authorised Total Weight (MATW) of **3500 kg**

1. Check the condition of the transport vehicle surface. If the surface is greasy, it must be cleaned before installing the machine on the transport vehicle.
2. Check the location and condition of the machine tie-down points.
3. Tie-down the machine at the points provided for that purpose and that are indicated on the machine.



⚠ DANGER

Blocking of turret (provided by the brake)
Additional accessories (bucket, arm, etc)
Rigging
Tension in lashing accessories
Measure the loading height
Grip on truck bed (frost, snow...)

* Using additional rigging accessories depends on the nature of the contact between the device and the transport vehicle and the weather conditions.

Please refer to the machine user manual.

14.3 Tying down the machine, page 129

Reference standards
NF EN 474-1 & NF ISO 15818

Created:
Updated: –

DEVICE

Weight of the vehicle (kg)	2525–2905

DEVICE CARRIER DEVICE

Nature of the contact	Steel-wood
Angle range α	20° – 60°
Angle range β	10° – 60°

ACCESSORIES		WLL[8] min (t)
Wedge (Lengthwise direction FR)	NONE*	
Wedge (Lengthwise direction RR)	NONE*	
Wedge (Lateral direction)	NONE*	
Slip resistant mat	NONE*	
Tie-down accessories	4	4 t

8. Working Load Limit (WLL)

INDEX

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