Operation
Introduction

General

The aim of this part of the manual is to guide the operator step-by-step through the task of learning how to operate the machine efficiently and safely. Read the Operation section through from beginning to end.

The operator must always be aware of events happening in or around the machine. Safety must always be the most important factor when you operate the machine.

When you understand the operating controls, gauges and switches, practice using them. Drive the machine in an open space, clear of people. Get to know the 'feel' of the machine and its driving controls.

Do not rush the job of learning, make sure you fully understand everything in the Operation section. Take your time and work efficiently and safely.

Remember:

- Be careful.
- Be alert.
- Be safe.

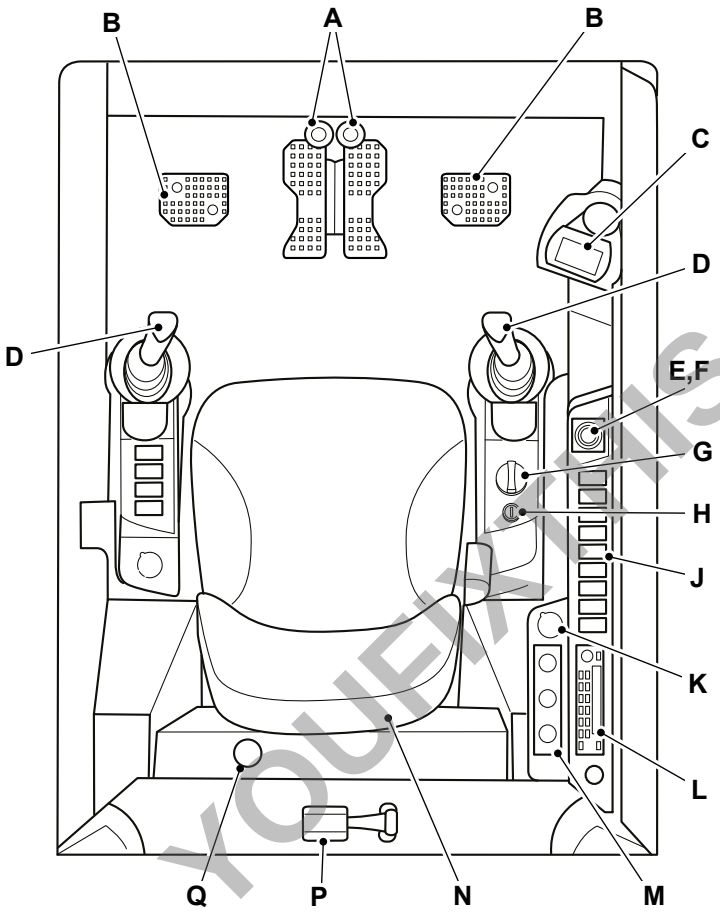
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Operator Station

Component Locations

Figure 11.



A Track controls Refer to: Operation > Drive Controls > Track Controls (Page 57).

B Swing control pedal Refer to: Operation > Operating Levers/Pedals > Excavator Arm Controls (Page 71).

C Instrument panel Refer to: Operation > Instruments (Page 59).

D Excavator controls Refer to: Operation > Operating Levers/Pedals > Excavator Arm Controls (Page 71).

E Dozer blade control lever Refer to: Operation > Operating Levers/Pedals > Dozer Blade Controls (Page 74).

F Two-speed tracking switch Refer to: Operation > Drive Controls > Track Controls (Page 57).

G Hand throttle control Refer to: Operation > Drive Controls > Hand Throttle Control (Page 57).

H Ignition key switch Refer to: About the Product > Interior Switches > Ignition Switch (Page 20).

J Switch console Refer to: About the Product > Console Switches (Page 18).

K Auxiliary power socket Refer to: Operation > Power Sockets (Page 88).

L Entertainment system

M HVAC (Heating Ventilation Air Conditioning) controls Refer to: Operation > Heating, Ventilating and Air-Conditioning (HVAC) (Page 86).

N Operator seat Refer to: Operation > Operator Seat (Page 41).

P Glass hammer Refer to: Operation > Entering and Leaving the Operator Station > Emergency Exit (Page 32).

Q Fire extinguisher (option)Refer to: Operation > Fire Extinguisher (Page 90).

R TAB (Triple Articulated Boom) pedalRefer to: Operation > Operating Levers/Pedals > Excavator Arm Controls (Page 71).

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Attachments
Working with Attachments

Introduction

Attachments

Use only the JCB approved attachments that are specified for your machine. Operating with non-specified attachments can overload the machine, causing possible damage and machine instability which could result in injury to yourself or others.

The use of non-approved attachments could invalidate your warranty.

Metal Splinters

You can be injured by flying metal splinters when driving metal pins in or out. Use a soft faced hammer or copper drift to remove and install metal pins. Always wear personal protective equipment.

Attachments

If you have an attachment which is not covered in the Operator's Manual do not install it, use it or remove it until you have obtained, read and understood the pertinent information. Install attachments only on the machines for which they were designed.

Some attachments are supplied with the instructions on the safety, installation, removal, operation and maintenance procedures. Read and fully understand these procedures before the attachment is installed, used and serviced. If there is anything you do not understand, ask your JCB dealer.

Before you use an attachment, make sure you understand how the attachment will affect the operational safety.

When an attachment is installed, there may be changes in the machines centre of gravity or overall dimensions. These change can effect for example, the machine stability, the gradients on which it is safe to operate or the safe distance from power lines.

Practice with an attachment off the job before you work with it for the first time.

A JCB attachment is designed and manufactured specifically to suit the machines hydraulic system, mounting components and safe load requirements.

An attachment which is not designed for use with the machine can cause damage and create a safety hazard for which JCB cannot be held responsible. Also the machines warranty and any other legislative compliance can be affected by the use of non JCB approved attachments.

If your machine needs the hydraulic system adapting to use an auxiliary attachment, you must consult your JCB dealer. Only suitably qualified personnel must re-route the hydraulic hoses.

All optional attachments will have limits on their operation for example, the lifting capacity, speeds, hydraulic flow rates. Always check the instructions supplied with the attachment or in the Specification section of this manual. Some specification limits may also be shown on the data/rating plate on the attachment.

This section of the Operator's Manual includes general information on the operation of the attachment and the procedures for the installation and removal of the attachment.

Attachments for your Machine

⚠ **CAUTION** Operation of this machine with an earth drill or breaker attached will alter machine stability.

Attachments will help increase the productivity of your machine, for more information contact your JCB dealer.

Remember, do not operate an attachment until you have read and fully understand the attachment operating instructions.

Do not operate or work with attachments until the machine hydraulic oil has reached its normal working temperature.

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Transporting the Machine

General

⚠ **WARNING** The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.

WARNING Make sure that the ramp incline does not exceed the machine's operational limits.

CAUTION Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tracks. Make sure the machine will not foul on the ramp angle.

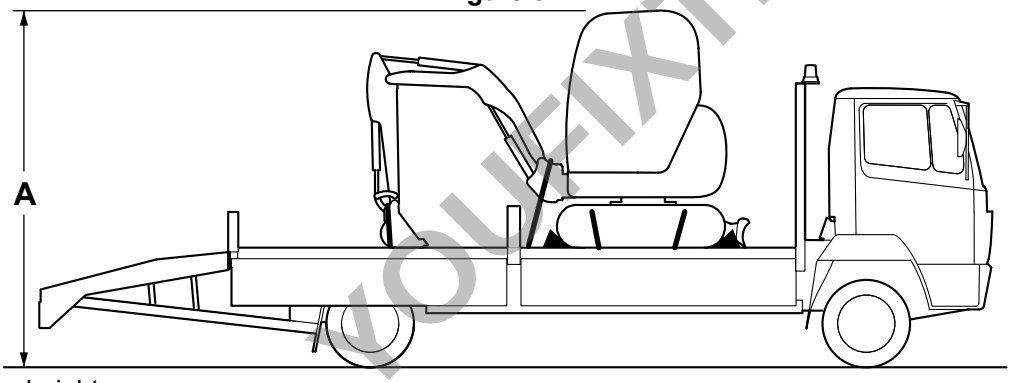
Before transporting the machine make sure you will be obeying the local rules and laws regarding machine transportation of all the areas that the machine will be carried through.

Check the condition of the transporting vehicle before loading the machine on to its trailer:

Check the Condition of the Transporting Vehicle

1. Make sure that the transporting vehicle is suitable for the dimensions and weight of your machine. Measure the clearance height. Make sure that the truck driver knows the clearance height before he drives away.

Figure 82.



A Clearance height

2. Remove all loose dirt that may otherwise come off and obstruct the highway and damage other vehicles.
3. Check the operation of the park brake.
4. Check the trailer bodywork for signs of damage.
5. Check the tyre pressures are correct (consult the manufacturer's manual).
6. Check the trailer lights are working and are the correct voltage for the towing vehicle (consult the manufacturer's manual).
7. Check the breakaway cable is serviceable.

Loading the Machine onto the Transporting Vehicle/Trailer

⚠ **CAUTION** The machine must be securely tied down to the transport vehicle to prevent lateral movement, fore-and-aft movement, and slewing of the superstructure. Failure to do so could cause injury to yourself or others.

1. Position the transporting vehicle on solid, level ground.
2. Apply the park brakes and lower any stability jacks.
3. Attach the loading ramps on to the transporter correctly.
4. Align the machine with the loading ramps, position the dozer blade to the front and fully raised.

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Access Apertures

General

When moved to their maintenance position, the access panels give you access to parts or areas of the machine that are not required during machine operation.

Before you operate the machine, make sure that all of the access panels are correctly in their closed or installed positions.

Engine Compartment Cover

Open

⚠ **WARNING** The engine has exposed rotating parts. Switch off the engine before working in the engine compartment. Do not use the machine with the engine cover open.

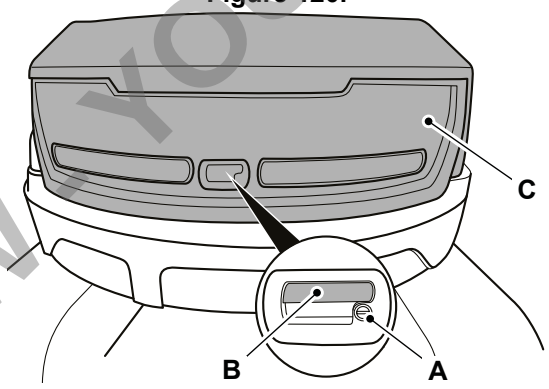
WARNING Airborne particles of light combustible material such as straw, grass, wood shavings, etc. must not be allowed to accumulate within the engine compartment or in the propshaft guards (when installed). Examine these areas frequently and clean at the beginning of each work shift or more often if required. Before opening the engine cover, make sure that the top is clear of debris.

1. Make the machine safe with the excavator lowered.

   Refer to: Maintenance > Maintenance Positions > Maintenance Position (Excavator Arm Lowered) (Page 142).

2. Use the ignition key to unlock the cover.
3. To release the latch, pull the button handle. The cover opens automatically and is supported on a gas strut.

Figure 120.



A Lock
B Handle
C Engine compartment cover

Close

1. Push the cover down.
2. Make sure the cover is correctly latched.
3. Use the ignition key to lock the cover.

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Maintenance Schedules

General

⚠ **WARNING** Maintenance must be done only by suitably qualified and competent persons.

Before doing any maintenance make sure the machine is safe, it must be correctly parked on solid, level ground.

To prevent anyone starting the engine, remove the ignition key. Disconnect the battery when you are not using electrical power. If you do not take these precautions you could be killed or injured.

A badly maintained machine is a danger to the operator and the people working around the operator. Make sure that the regular maintenance and lubrication tasks listed in the service schedules are done to keep the machine in a safe and efficient working condition.

Apart from the daily tasks, the schedules are based on the machine running hours. Keep a regular check on the hourmeter readings to correctly gauge the service intervals. When there is no hourmeter installed, use the calendar equivalents to determine the service intervals.

Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are corrected immediately.

More frequent checks of engine components than the engine manufacturer recommends do not invalidate emissions warranty.

How to Use the Maintenance Schedules

The schedules show the service tasks which must be done and their intervals.

The services must be done at either the hourly interval or the calendar equivalent, whichever occurs first.

The intervals given in the schedules must not be exceeded. If the machine is operated under severe conditions (high temperature, dust, water, etc.) shorten the intervals.

Table 6.

O	Service task can be completed by a competent operator. Details of how to complete the service task are given in the Operator's Manual.
□	We recommend that a Service Engineer completes the service task. Details of how to complete the service task are given in the Service Manual.

Maintenance Intervals

Table 7.

Interval (h)	Calendar Equivalent
10	Daily
50	Weekly
500	Six months
1000	Yearly
2000	Two years

Pre-start Cold Checks, Service Points and Fluid Levels

Table 8.

Component	Task	10	50	500	1,000	2,000	5,000
Attachments/Optional Equipment							
As Required	Lubricate	O	O	□	□	□	□
As required	Check (condition)	O	O	□	□	□	□
Body and Framework							

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Torque Values

General

Table 21.

Item	Torque
	N·m
FOPS (Falling Object Protective Structure) bolts	74
ROPS (Roll-Over Protective Structure) (cab mounts) bolts	70
Track plate bolts	74
Track tensioner cover plate bolts	43

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Getting the Machine Moving

General

⚠ **WARNING** Do not dismount a moving machine.

The machine does not have gears. Do not overwork the engine unnecessarily. Operate at an engine speed suitable for the duty being carried out.

When moving the machine, keep it under control at all times. Stay alert for obstructions and possible hazards. Approach deep mud slowly.

Take particular care when reversing. Make sure that the way behind is clear before reversing.

The machine may be fitted with a travel alarm (option). The alarm will sound whenever the track control levers are moved from their neutral positions (forwards or backwards).

Procedure

After you have warmed up the engine, move off as described below.

Control and switch locations are provided within this manual.

1. Make sure that your seat belt is correctly fastened.
2. Make sure that the seat is correctly adjusted.
3. Move off.
   - 3.1. Check that the attachments are in the travel position.
   - 3.2. Take hold of both track control levers in one hand or put your feet on the foot pedals.
   - 3.3. Make sure that it is safe to move off.
   - 3.4. Move the levers forward or backward as required and pull the throttle lever slowly backwards until the desired speed is attained.
   - 3.5. To increase tracking speed operate the two speed tracking switch.

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Operating Levers/Pedals

General

⚠ **WARNING** Make sure it is clear overhead before raising the boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.

CAUTION Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you could lose control of the machine.

Control Layouts

⚠ **WARNING** Control lever/switch action may vary on machines, instructional labels near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the instructional label to make sure you select the desired action.

The control levers and switches may vary on machines.

Excavator Arm Controls

ISO/SAE

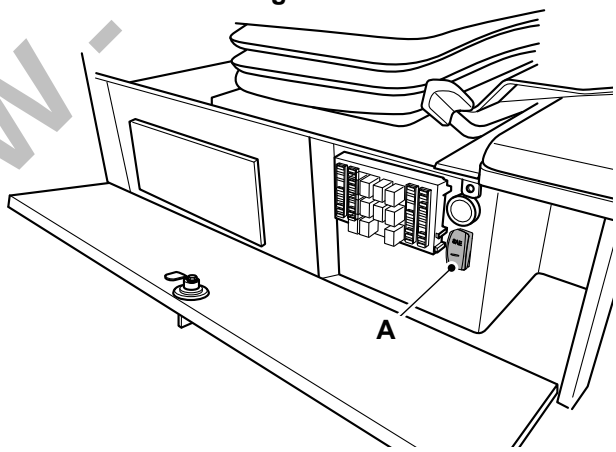
The instrument panel allows the operator to select either the ISO (International Organization for Standardization) or SAE (Society of Automotive Engineers) excavator control pattern.

Before you operate the excavator controls check the instrument panel to see which control pattern has been selected.

When the SAE switch is pressed the control pattern is changed to SAE from ISO. SAE is displayed on the instrument panel. Refer to Figure 58.

When the switch is pressed again the control pattern is changed back to ISO. ISO is displayed on the instrument panel.

Figure 58.



A SAE Switch

Horn Button

The horn button is located on the right hand excavator lever. Refer to: About the Product > Operator Station > Component Locations (Page 17). Press and hold the button to activate the horn. It functions only when the ignition switch is on.

Excavator Controls

The excavator controls consist of the excavator levers and the swing pedal.

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Direct-Mounted Attachments

General

⚠ **WARNING** If two people are doing this job make sure that the person working the controls is a competent operator. If the wrong control lever is moved, or if the controls are moved violently, the other person could be killed or injured.

Installation

This operation is easier done by two people - one person to operate the controls and one to line up the pivots.

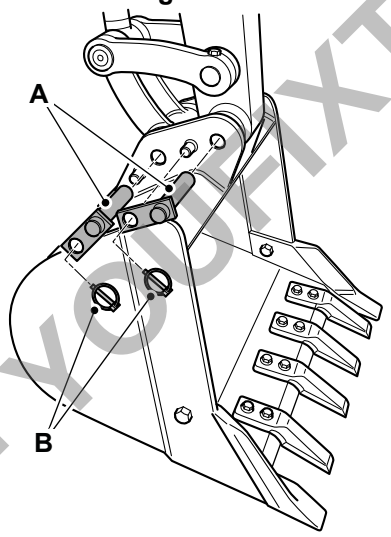
1. Set the bucket flat on solid, level ground, using a suitable lifting device.

   CAUTION! *Do not use your fingers through the holes to align the links.*

2. Carefully align the holes in the dipper and bucket link with the bucket. If necessary move the machine to align the pivot pin holes.

3. Install the pivot pins and lynch pins.

Figure 95.



A Pivot pin

B Lynch pin

Removal

1. Slew the boom so that it is straight in front of the machine.

2. Rest the bucket on solid, level ground, with the dipper approximately vertical and the bucket flat to the ground. Block the bucket to prevent its movement.

   CAUTION! *Stand clear and to one side of the bucket while you remove the pivot pins. With the pins removed, the bucket could roll over.*

3. Remove the lynch pin and the pivot pins.

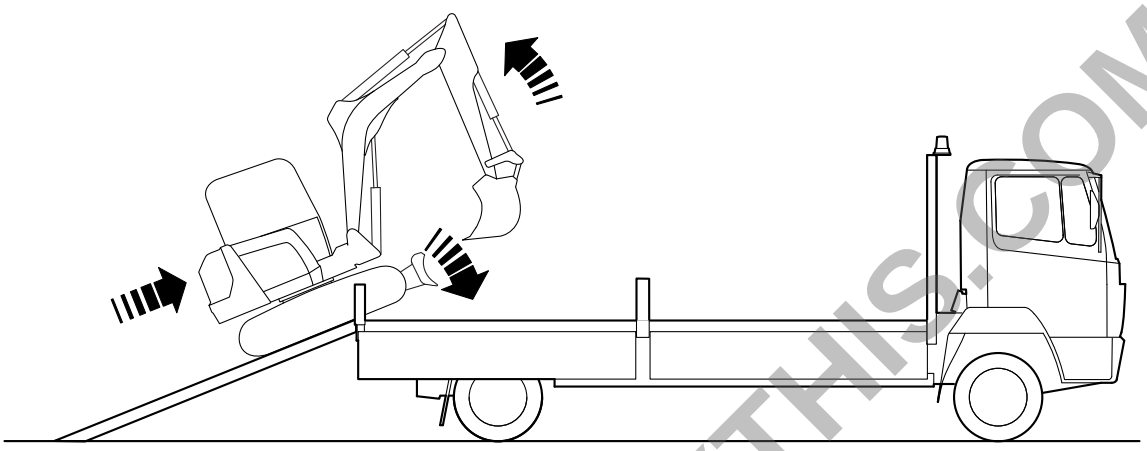
4. Using the controls, carefully lift the dipper clear of the bucket.

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5. Slightly extend the boom and dipper for stability.
6. With the machine in low speed mode, track forward onto the ramp slowly and smoothly. Make sure the bucket will not contact the transporter ramps when loading the machine.

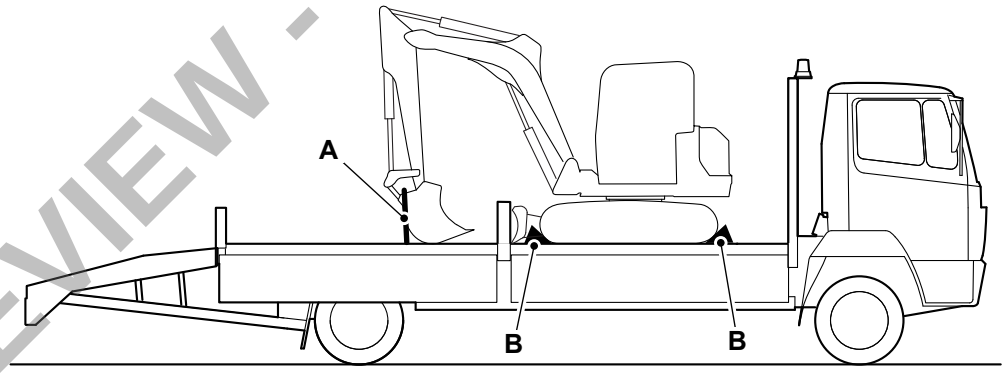
Figure 83.



7. Slowly drive the machine to the top of the ramps.
8. Lower the boom until the bucket contacts the transporter deck.
9. Slowly drive forward. As the tracks begin to clear the ramps, gently raise the boom allowing the machine to rock forward onto the transporter bed.
10. Slew the cab.

    Angle: 180°
11. Lower the bucket onto the transporter bed.

Figure 84.



A Securing strap (bucket) **B** Skids

12. Crowd the bucket. Position the dipper vertically and lower the boom until the bucket rests on a wooden block on the trailer bed.
13. Stop the engine.
14. Position a strap of suitable breaking strain over the bucket and secure to the trailer shackles.
15. Place skids under each track at the front and rear to prevent movement of the machine in the fore and aft direction.
16. Attach straps of suitable breaking strain to the tie down points. The tie down points are identified with a decal. Attach the straps to the trailer shackles to prevent lateral movement of the machine.

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Notice: Do not exceed the correct level of engine oil in the sump. If there is too much engine oil, the excess must be drained to the correct level. An excess of engine oil could cause the engine speed to increase rapidly without control.

1. Make the product safe.
   Refer to: Maintenance > Maintenance Positions (Page 142).
2. Wait for the oil to drain back into the engine sump before you take a reading. If not, a false low reading may be recorded which can cause the engine to be overfilled.
3. Get access to the engine compartment (if applicable).
   Refer to: Maintenance > Access Apertures (Page 146).
4. Remove and clean the dipstick.
   Refer to: Maintenance > Service Points (Page 143).
5. Replace the dipstick.
6. Remove the dipstick.
7. Check the oil level. The oil should be between the two marks on the dipstick.
8. If necessary, add more oil:
   8.1. Remove the filler cap.
   Refer to: Maintenance > Service Points (Page 143).
   8.2. Add the recommended oil slowly through the filler point
   Refer to: Technical Data > Fluids, Lubricants and Capacities (Page 190).
   8.3. Replace the dipstick.
   8.4. Remove the dipstick.
   8.5. Check the oil level, if necessary add more oil.
   8.6. Replace the dipstick
   8.7. Replace the filler cap.
9. Close and secure the engine cover (if applicable).

Replace

⚠ **Notice:** Do not exceed the correct level of engine oil in the sump. If there is too much engine oil, the excess must be drained to the correct level. An excess of engine oil could cause the engine speed to increase rapidly without control.

WARNING Hot oil and engine components can burn you. Make sure the engine is cool before doing this job.

Used engine crankcase lubricants contain harmful contaminants. In laboratory tests it was shown that used engine oils can cause skin cancer.

CAUTION It is illegal to pollute drains, sewers or the ground. Clean up all spilt fluids and/or lubricants.

Used fluids and/or lubricants, filters and contaminated materials must be disposed of in accordance with local regulations. Use authorised waste disposal sites.

1. Make the machine safe.
   Refer to: Maintenance > Maintenance Positions (Page 142).
2. Get access to the engine compartment.
   Refer to: Maintenance > Access Apertures (Page 146).
3. Remove the oil filler cap.

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