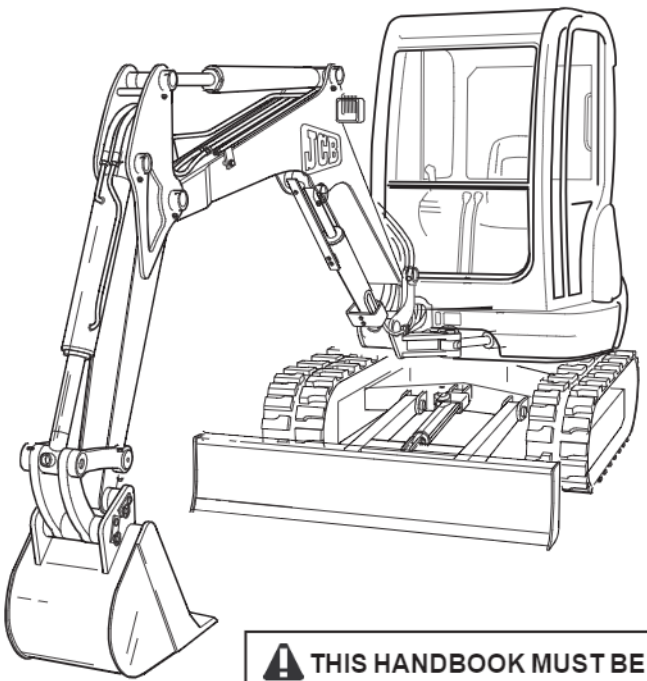
OPERATOR HANDBOOK



8027Z
8032Z

⚠ THIS HANDBOOK MUST BE KEPT IN THE MACHINE AT ALL TIMES ⚠

Publication Number 9801/8850

Issue 3

WARNING

Study this Handbook Before Starting the Machine

You must understand and follow the instructions in this handbook. Abide by all relevant laws and regulations. If you are unsure about anything, ask your JCB dealer or employer. **Do not guess**, or you or others could be killed or seriously injured.

INT-1-1-1

In this handbook and on the machine there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

DANGER

Denotes an extreme hazard exists. If proper precautions are not taken it is highly likely that you (or others) could be killed or permanently injured.

INT-1-2-1

WARNING

Denotes a hazard exists. If proper precautions are not taken it is highly likely that you (or others) could be killed or injured.

INT-1-2-2

CAUTION

Denotes a reminder of safety practices. May also direct your attention to unsafe practices which could result in personal injury or damage to the machine.

INT-1-2-3

CONTENTS

The illustrations in this handbook are for guidance only. Where the machines differ, the text and/or illustration will specify.

The page numbers do not run concurrently in this publication, each section carries its own numbers which allows the inclusion of additional pages in later issues.

This handbook contains operating instructions and operator information for all machine range variants, some of the functions may not be available on your machine.

The maintenance section shows the correct procedures for the regular routine service operations only. Major servicing operations should only be carried out by suitably qualified service engineers using the appropriate service tools where necessary.

Introduction

CONTENTS

Operation

Operation (Continued)

Maintenance

Specifications

ABOUT THIS HANDBOOK

This handbook provides information for the JCB range of 'Z' Tracked Excavators (Mini Excavators).

Using This Handbook

This handbook is arranged to give you a good understanding of the machine and its safe operation. Read this handbook before using the machine. Particular attention must be given to all safety aspects of operating the machine.

General warnings in this chapter are repeated throughout the book, as well as specific warnings. Read all the safety statements regularly, so you do not forget them.

Treat this handbook as part of the machine. Keep it clean and in good condition. Do not operate the machine without a handbook in the cab. If there is anything you are unsure about, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

The manufacturer's policy is one of continuous improvement. The right to change the specification of the machine without notice is reserved. No responsibility will be accepted for discrepancies which may occur between specifications of the machine and the descriptions contained in this publication.

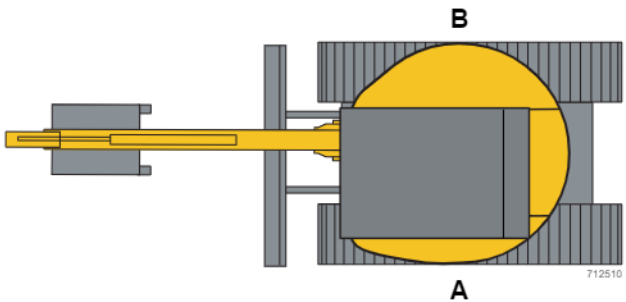
Units of Measurements

In this book, the S.I. system of units is used. For example, liquid capacities are given in litres. The imperial units follow in parenthesis ( ) e.g. 28 litres (6 gal).

ABOUT THIS HANDBOOK - continued

Left Side, Right Side

In this handbook, 'left' **A** and 'right' **B** means your left and right when you are seated correctly in the machine.



Using the Machine

To use the Mini Excavator efficiently and safely you must know the machine and have the skill to use it. This handbook instructs you on the machine, its controls and its safe operation. It is not a training manual. If you are a new operator, get yourself trained in the skills of using a Mini Excavator before trying to work with it. If you don't you will not do your job well, and you will be a danger to yourself and others

Machine and Serial Numbers

This handbook covers the following machines:

8027Z from machine serial number M898000

8032Z from machine serial number M899000

Service Contract

In order to keep your machine working efficiently, it is essential that it is properly and regularly maintained in accordance with the service schedules included in this handbook.

Your dealer will already have discussed your service requirements. When the dealer service has been completed. You are strongly advised to take advantage of a regular service contract.

SAFETY - YOURS AND OTHER PEOPLES

All mechanical equipment can be hazardous. When a mini excavator is properly maintained and operated correctly, it is a safe machine to work with. But when it is poorly maintained or operated carelessly it can become a danger to the operator and everyone around.

In this handbook and on the machine you will find warning messages. Read them, understand them. They tell you of hazards and how to avoid them. If you do not understand the messages, ask your employer or local JCB Dealer.

But safety is not just a matter of responding to the warnings. All the time you are working on or with the machine you must be thinking what hazards there might be and how to avoid them.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything, check it.

Remember **BE CAREFUL**
BE ALERT
BE SAFE

Now read the rest of this section before moving on to the rest of the handbook.

GENERAL SAFETY CHECK LIST

WARNING

Handbook

You and others can be injured if you operate or maintain the machine without first studying this handbook. Read the safety instructions before operating the machine. If you do not understand anything ask you employer or JCB dealer to explain it. Keep this handbook clean and in good condition. Do not operate the machine without a handbook in the cab or if there is anything on the machine you do not understand. It is recommended that you attend a training course before you operate your machine.

HOP1

WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear protectors and industrial gloves. Keep cuffs fastened. Do not wear a neck tie or scarf and keep long hair restrained.

HOP4

GENERAL SAFETY CHECK LIST - continued

CAUTION

Regulations

Obey all laws, work site and local regulations which affect you and your machine.

INT-1-3-3

WARNING

Lifting Equipment

You can be injured if you use faulty equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

WARNING

Raised Attachments

Raised attachments can fall and injure you. Do not walk or work under raised attachments unless they are safely blocked.

HOP6

OPERATING SAFETY CHECK LIST

WARNING

Drive Safety

Drive the machine smoothly. Avoid repeated start/stop or spin turn manoeuvers. Avoid unnecessary zig-zag driving.

8-1-2-2

WARNING

Machine Safety

Stop work at once if a fault developes. Abnormal sounds and smells can be signs of trouble. Inspect and repair before resuming work.

8-1-2-3

WARNING

Practice

You or others can be killed or seriously injured if you do unfamiliar operations without first practising them. Practise away from the work site on clear area. Keep other people away. Do not perform new operations until you are sure you can do them safely.

HOP7

WARNING

Machine Limits

Operating the machine beyond its design limits can damage the machine, it can also be dangerous. Do not operate the machine outside its limits. Do not try to upgrade the machine performance with unapproved modifications.

HOP10

WARNING

Entering/Leaving

Always face the machine when entering and leaving the cab. Use the step(s) and handrails. Make sure the step(s), handrails and your boot soles are clean and dry. Do not jump from the machine, do not use the machine controls as handholds, use the handrails.

HOP12

WARNING

Exhaust Gases

Breathing the machine exhaust gases can harm and possibly kill you. Do not operate the machine in enclosed spaces without making sure there is good ventilation. If possible, fit an exhaust extension. If you begin to feel drowsy stop the machine at once. Get out of the cab into fresh air.

HOP13

OPERATING SAFETY CHECK LIST - continued

WARNING

Engine

The engine has rotating parts. Do not open the engine cover while the engine is running. Do not use the machine with the cover open. Engine cover to be kept locked to prevent unauthorised access.

HOP11

WARNING

Controls

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab.

HOP9

WARNING

Controls - ISO/SAE

Before operating the excavator controls always check to see which control pattern has been selected. Operate the machine slowly until you are familiar with the pattern selected. If the pattern selection indicator lamp is not illuminated, DO NOT operate the machine until any faults have been rectified.

WARNING

Fires

To help prevent machine fires it is recommended that the engine compartment is inspected every week. Any flammable debris, especially leaves, twigs, paper waste etc. must be cleared away from areas adjacent to the engine exhaust system and manifold.

WARNING

Do not use this Excavator as a 'Crane'. Consult National Lifting Regulations.

OPERATING SAFETY CHECK LIST - continued

WARNING

Work Sites

Work sites can be hazardous. It is the operators responsibility to inspect the site before working on it. Look for potholes, weak ground, hidden rocks etc. Check for utilities such as electric cables (overhead and underground), gas and water pipes etc. Mark the positions of the underground cables and pipes. Make sure that you have enough clearance beneath overhead cables and structure. If necessary, contact the local authorities before commencing work.

HOP15

WARNING

Visibility

Accidents can be caused by working in poor visibility. Keep windows clean and use your lights to improve visibility. Do not operate the machine if you cannot see properly.

HOP14

WARNING

Lifting

Do not lift objects with the excavator or the boom.

HOP24

WARNING

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or whilst operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9

WARNING

Feeling Unwell

Do not attempt to operate the machine if you are feeling unwell. By doing so you could be a danger to yourself and those you work with.

8-1-2-4

WARNING

Machine Condition

A defective machine can injure you or others. Do not operate a machine which is defective or has missing parts. Make sure that maintenance procedures are completed before using the machine.

HOP8

OPERATING SAFETY CHECK LIST - continued

WARNING

Fibre Optic Cables

If you cut through a fibre optic cable, DO NOT look into the end of it, your eyes could be permanently damaged

WARNING

Parking

An incorrectly parked machine may move without an operator. Follow the instructions in this handbook to park the machine correctly.

HOP16

WARNING

Safety Barriers

Unguarded machines can be dangerous. In public places, or where your visibility is reduced, place barriers around the work area to keep people away.

HOP21

WARNING

Banks and Trenches

Banked material and trenches can collapse. Do not work or drive too close to banks and trenches where there is danger of collapse.

HOP19

DANGER

Sparks

Explosions and fire can be caused by sparks from the exhaust or the electrical system. Do not use the machine in enclosed areas where there is flammable material vapour or dust.

HOP22

OPERATING SAFETY CHECK LIST - continued

WARNING

Safe Working Loads

Overloading the machine can damage it and make it unstable.

HOP23

WARNING

Passengers

Passengers in or on the machine can cause accidents. The JCB Excavator is a one man machine, do not carry passengers

HOP17

WARNING

Slew and Swing Lock

The slew lock must be engaged when transporting the machine.

The swing lock must be in place when the machine is excavating in fore and aft configuration and 360° slew is used for spoil.

WARNING

Hillsides

Operating the machine on hillsides can be dangerous if proper precautions are not taken. Ground conditions can be changed by rain, snow or ice. Check the site carefully, when applicable, keep excavator end and attachments low to the ground.

HOP20

CAUTION

The engine exhaust is extremely hot, cover the exhaust with suitable heat resistant material when working on the engine.

WARNING

Decals

You can be injured if you do not obey the decal safety instructions. Keep decals clean. Replace unreadable or missing decals with new ones before operating the machine. Make sure replacement parts include warning decals where necessary.

INT-1-3-4

OPERATING SAFETY CHECK LIST - continued

WARNING

Earth Drills and Breakers

Operation of this machine with an earth drill or breaker fitted will alter machine stability. Refer to the attachments stability page before working on inclines. HOP 26

CAUTION

A wide range of optional attachments is available to increase the versatility of your machine. Only JCB approved attachments are recommended for use with your machine. Consult your JCB Distributor for the full list of approved attachments available.

JCB attachments are designed and manufactured specifically to suit the machine's hydraulic system, mounting arrangements and safe load requirements. Attachments which are not designed for use with this machine may cause damage and create safety hazards for which JCB cannot be held responsible. In addition the machine's warranty, "CE" and other legislative compliance may be affected by the use of non-JCB approved attachments.

2-4-1-13/2

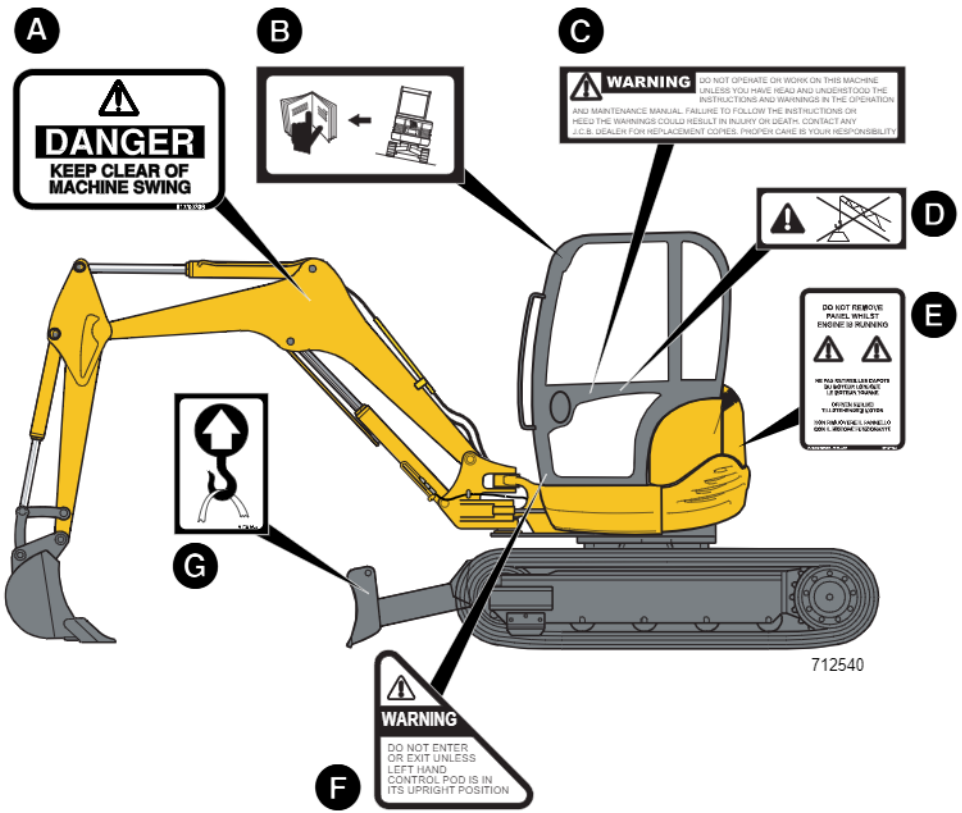
CAUTION

This machine is manufactured in compliance with legislative and other requirements. It should not be altered in any way which could affect or invalidate any of these requirements. For advice consult your JCB Distributor.

Reference should also be made to Optional Attachments section where appropriate.

INT-1-3-10

SAFETY DECALS



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SAFETY DECALS - continued

Decals on the machine warn you of particular hazards. Each decal is attached close to part of the machine where there is a possible hazard. Read and make sure you understand the safety message before you work with or on that part of the machine.

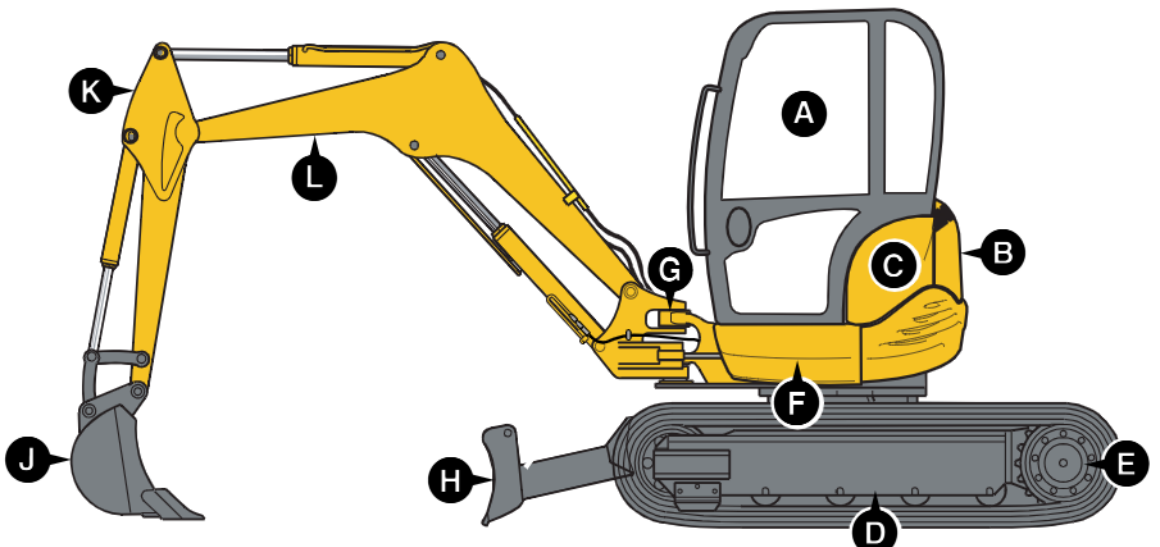
Keep all decals clean and readable. Replace lost or damaged decals. Each decal has a part number printed on it. Use this number to order a new decal from your JCB Dealer.

WARNING

If you need eye glasses for reading make sure that you wear then when reading the safety decals. Decals are strategically placed around the machine to remind you of possible hazards. Do not over stretch or place your self in dangerous positions to read the decals.
HOP25

DECAL	DEFINITION
A	Danger, Keep clear of machine swing.
B	Read the operation and maintenance manual, before operating the machine on inclines.
C	Warning, Read the operation and maintenance manual before operating the machine.
D	Warning, Do not use excavator as a 'crane'. Consult National Lifting Regulations.
E	Warning, Do not remove panel whilst engine is running.
F	Do not enter or exit the cab unless left hand control pod is in it's upright position.
G	Lift point.Warning,

THE JCB 'Z' MINI EXCAVATOR



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THE JCB 'Z' MINI EXCAVATOR - continued

The main components of the Mini Excavator are as follows:-

A Cab
B Engine compartment
C Hydraulics compartment (other side)
D Undercarriage
E Track drive motor
F Main frame
G Kingpost
H Dozer
J Bucket
K Dipper
L Boom

The aim of this part of the handbook is to introduce you to the machine you will be operating. The main parts of the machine will be named and identified. What they do and how they do it will be briefly explained. Some perhaps unfamiliar words used later in this handbook will also be explained.

Your JCB Dealer will gladly give you more information if you want it.

General Description

The JCB 'Z' Mini Excavator is a tracked excavator, incorporating the facility to slew the body of the machine 360^{O}, within the width of the tracks (known as Zero Tail Swing).

A boom swing facility, dozer and an excavating bucket make the machine versatile and highly manoeuvrable. This allows a wide range of work to be undertaken.

IDENTIFYING YOUR MACHINE

The machine has a Data Plate attached to the left hand front face of the machine.

The serial numbers of the machine, engine and gearboxes are stamped on this plate.

If the engine is replaced, stamp the new serial number in place of the old one.

Explanation of Vehicle Identification Number (VIN)

Code	A	B	C	D	E
Example	**SLP**	**0803**	**X**	**E**	**0765001**

A World Manufacturer Identification SLP = JCB
B Machine Model 0803 = 803

C Year of Manufacture

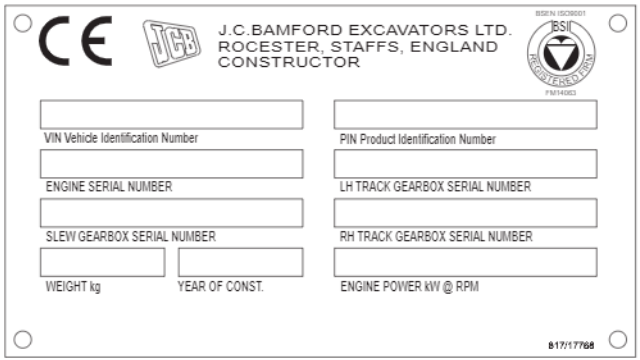
R = 1994	W = 1998	2 = 2002
S = 1995	X = 1999	3 = 2003
T = 1996	Y = 2000	4 = 2004
V = 1997	1 = 2001	5 = 2005

D Manufacturers Location E = England
E Machine Serial Number 0765001

Explanation of Engine Identification Number

Code	A	B	C	D	E
Example	**KE**	**50390**	**J**	**000001**	**y**

A Engine Type
B Engine Parts List
C Country of Manufacture
D Engine Serial Number
E Year of Manufacture



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TOPS AND FOGS - Optional

WARNING

Modified and wrongly repaired TOPS & FOGS Structures are dangerous. Do not modify the TOPS & FOGS Structure. Do not attempt to repair the TOPS & FOGS Structure. If the TOPS & FOGS Structure has been in an accident, do not use the machine until the structure has been inspected and repaired. This must be done by a qualified person. For assistance, contact your JCB dealer. Failure to take precautions could result in death or injury to the operator.

5-3-1-7

Machines built to TOPS and FOGS standards have an identification label fitted to the cab.

WARNING

The TOPS & FOGS cab is designed to give you protection in an accident. If you do not wear the seat belt you could be thrown about inside the cab, or thrown out of the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.

2-2-1-9

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INTRODUCTION

This chapter is arranged to guide you step-by-step through the task of learning how to use the machine. Read it through from beginning to end. By the end of the chapter you should have a good understanding of the machine and how to operate it.

Pay particular attention to all safety messages. They are there to warn you of possible hazards. Do not just read them-think about what they mean. Understand the hazards and how to avoid them.

If there is anything you do not understand, ask your JCB dealer, he will be pleased to advise you.

When you have learned where the driving controls are and what they do, practise using them. Practise driving the machine in a safe, open space clear of other people.

Get to know the "feel" of the machine and its driving controls.

Move on to the attachment controls only when you can drive the machine confidently and safely.

Take great care when practising with the attachment controls. Practise in an open space, keep people clear. Do not jerk the controls: operate them slowly until you understand the effect they have on the machine.

Finally, do not rush the job of learning. Take your time and take it safely.

Remember **BE CAREFUL**
BE ALERT
BE SAFE

BEFORE ENTERING THE CAB

WARNING

Walking or working under raised attachments can be hazardous. You could be crushed by the attachments or get caught in the linkages.

Lower the attachments to the ground before doing these checks. If you are new to his machine, get an experienced operator to lower them for you.

If there is nobody to help you, study this handbook until you have learned how to lower the attachments. Also make sure that the slew lock is engaged before doing these checks.

The following checks should be made each time you return to the machine after leaving it for any period of time. We advise you also to stop the machine occasionally during long work sessions and do the checks again.

All these checks concern the serviceability of the machine. Some concern your safety. Get your service engineer to check and correct any defects.

BEFORE ENTERING THE CAB - continued

Machine Walk Round Inspection

1 **Check for cleanliness:**

a Clean the windows and light lenses.

b Remove dirt and debris, especially from around the linkages, rams, pivot points and radiator.

c Make sure the cab and handrails are clean and dry.

d Clean all safety decals. Replace any that are missing or cannot be read.

2 **Check for damage:**

a Inspect the machine generally for damaged and missing parts.

b Make sure that the bucket teeth are secure and in good condition

c Make sure that all the pivot pins are secured correctly in place

d Inspect the windows for cracks and damage

e Check for oil, fuel and coolant leakages beneath the machine.

WARNING

You could be killed or injured with damaged tracks. Do not use the machine with damaged or excessively worn tracks.

HOP27

3 **Check the Tracks (Rubber)**

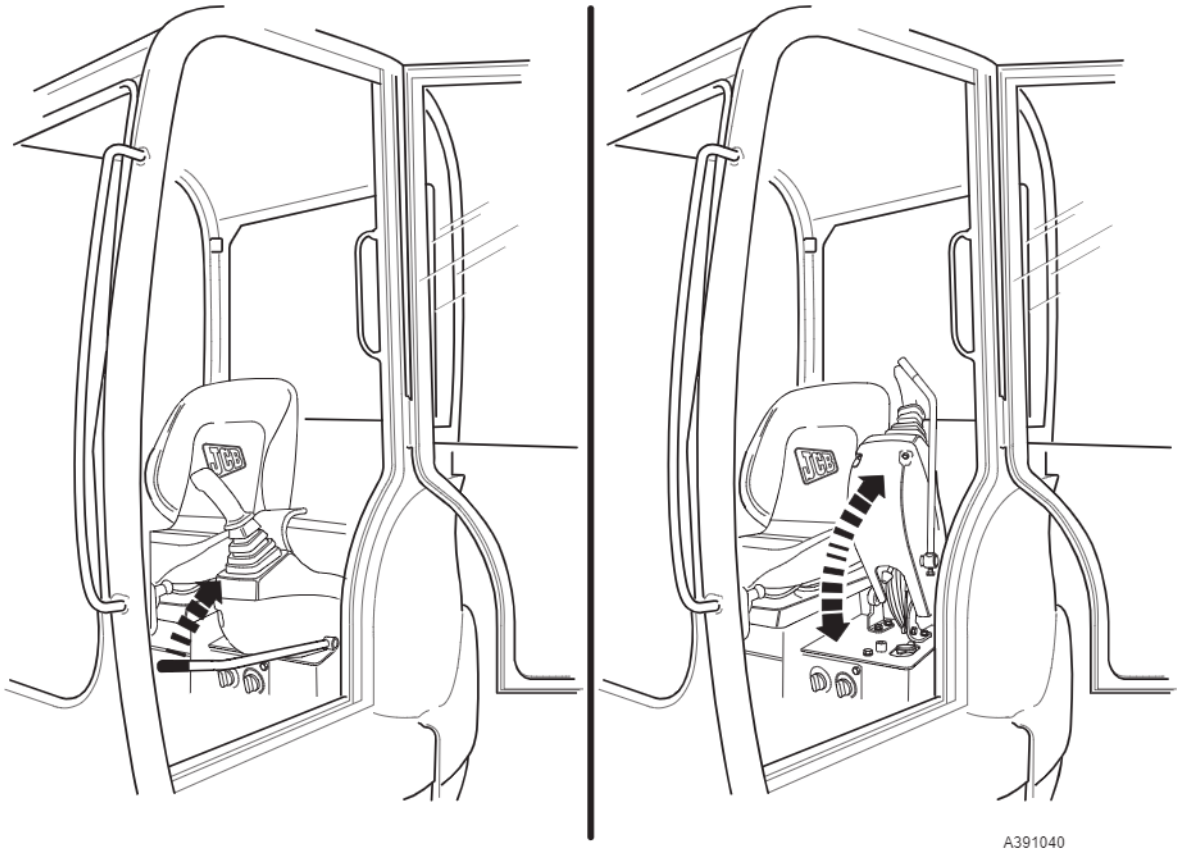
Check for cut rubber and penetration by sharp objects. Do not use a machine with damaged tracks.

4 **Check the engine cover/panels and fuel filler cap**

a Make sure the engine cover / panels are fitted and securely locked.

b Make sure the fuel filler cap is tightly closed (we also recommend that you lock it).

ENTERING/EXITING THE CAB



ENTERING/EXITING THE CAB - continued

WARNING

Do not enter or exit the cab unless the arm rest or lever lock is fully engaged (raised position).

To give sufficient clearance to enter or leave the cab, the left lever lock must be raised.

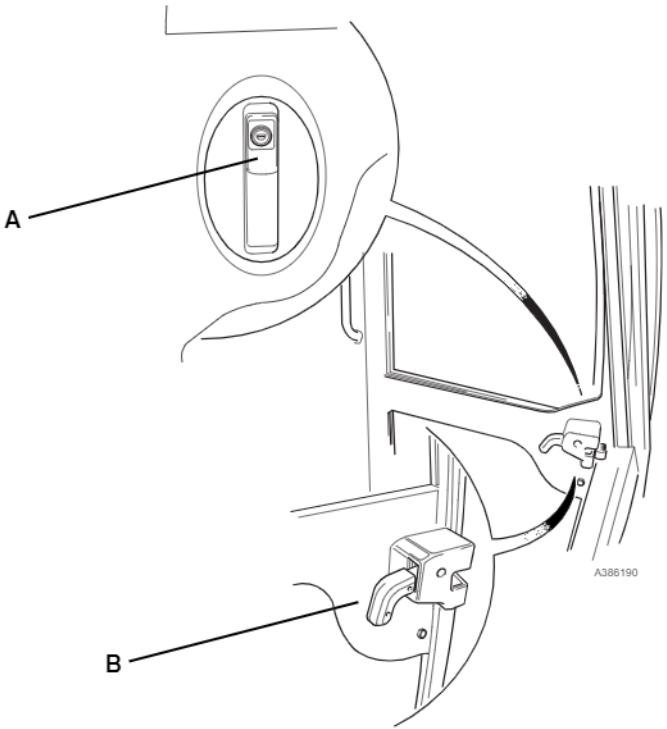
When the lever lock and control pod are in the raised position the excavator controls cannot be operated. Lowering the lever lock to the normal position connects the excavator controls and allows normal operation.

It is recommended that the engine is switched off before exiting the machine.

WARNING

Always face the machine when entering or leaving the cab. Use the step(s) and handrails. Make sure the step(s), handrails and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls or lever locks as handholds, use the handrails. Failure to follow these instructions could result in unexpected movement of the machine.

CAB



CAB - continued

The cab is bolted on top of the mainframe and is a welded steel construction. The cab has sliding windows on the right side, a hinged door also containing an opening window and an up and over windscreen. All windows are of toughened glass. The cab is fitted with a windscreen wash/wipe, heater fan, seat and all operating controls and instruments.

CAUTION

Do not drive the machine with the door unlatched. It must be correctly closed when operating the machine.

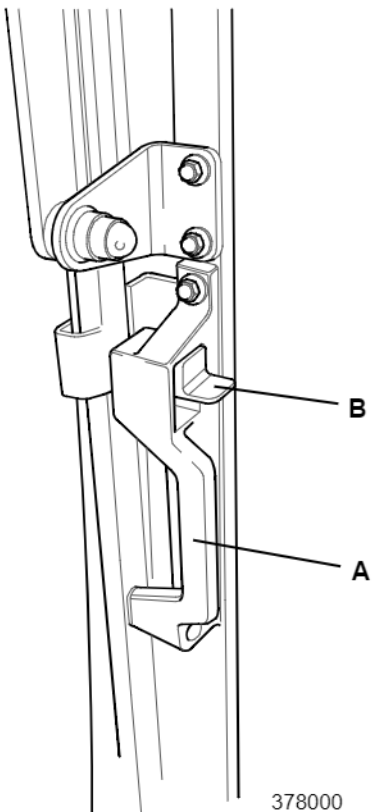
Opening and Closing the Door

To open a door from the outside, unlock it with the key provided and pull on the handle **A** to release the catch. To open a door from inside, push lever **B**. Close the door from the inside by pulling it firmly using the handle, it will latch itself. The door must be in the closed position when operating the machine.

OPENING THE WINDSCREEN

To open the up and over window, hold handles **A**, press and hold down securing levers **B**. Lift the screen into a position parallel with the roof using handles **A,** secure in position by releasing levers **B**.

***Note**: Care must be taken when lowering the window not to bump the top edge of the lower front window.*

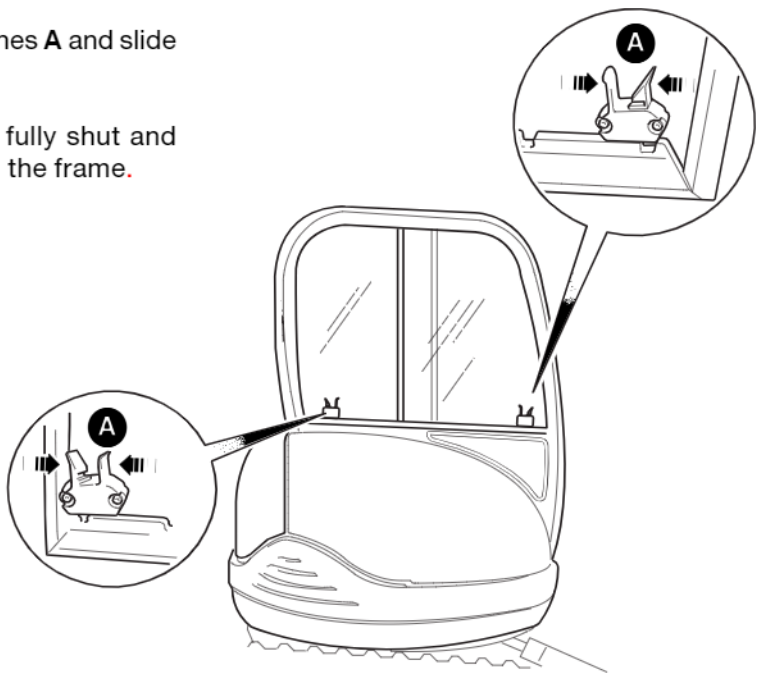


OPENING THE SIDE WINDOWS AND DOOR WINDOW

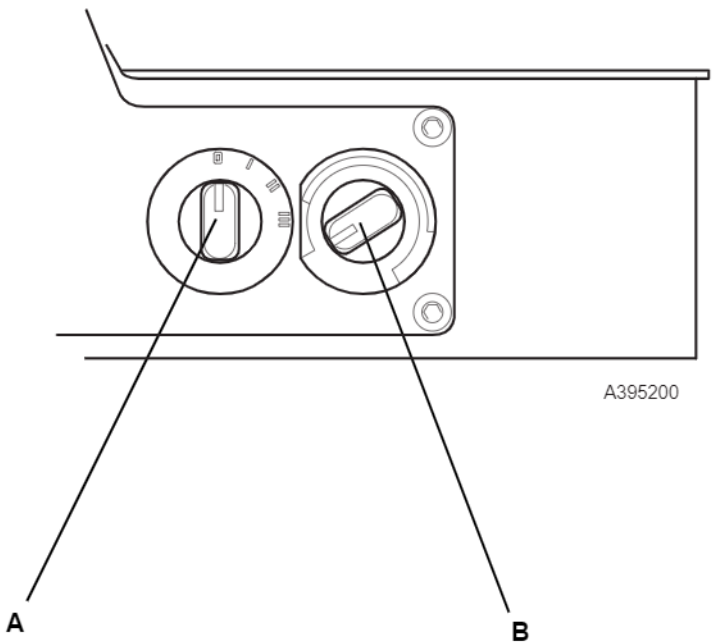
The windows are held closed by catches **A** operated from inside the cab.

To open the windows, operate the catches **A** and slide the windows to the desired position.

To close a window, slide the window fully shut and check that the catch **A** has located on the frame.



HEATER CONTROLS



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HEATER CONTROLS - continued

Air can be directed into the cab by selecting the required fan speed using switch **A**. Temperature control is by means of rotary dial **B**.

SEAT CONTROL

WARNING

Do not adjust the seat with the engine running otherwise your legs could knock the control levers.

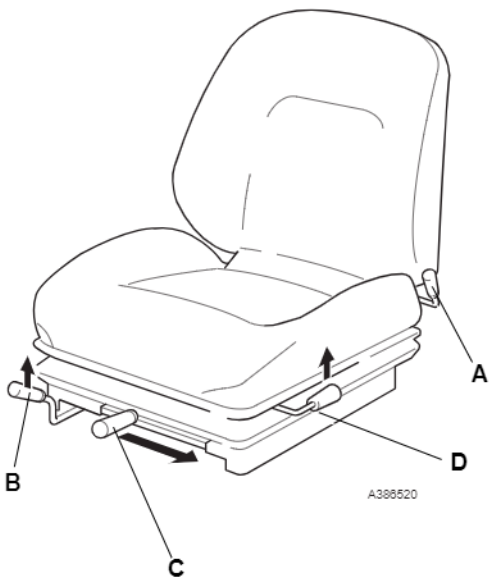
HOP31

Depending on the type of machine various adjustments can be made to the positions of the control levers and the seat consoles/armrests.

The operators seat can be adjusted for your comfort. A correctly adjusted seat will reduce operator fatigue. Position the seat so that you can comfortably reach the controls with your feet on the cab floor. The seat is adjustable for height and reach.

CAUTION

Having adjusted the seat position, ensure the seat locking lever has engaged fully.



A Backrest angle adjustment
B Horizontal adjustment
C Weight adjustment (50 - 120 kg [110 -243 lb])
D Seat cushion tilt control

SEAT BELT

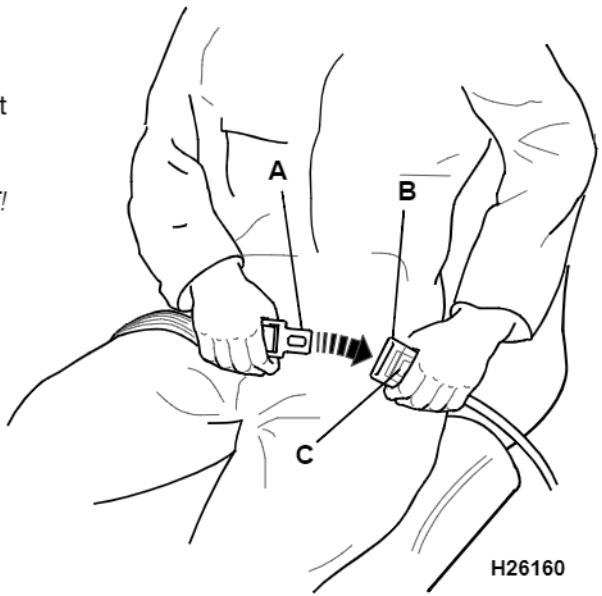
Fasten the Seat Belt

Sit correctly in the seat. Make sure the belt is not twisted. Push the male fitting **A** into the buckle **B** until it latches.

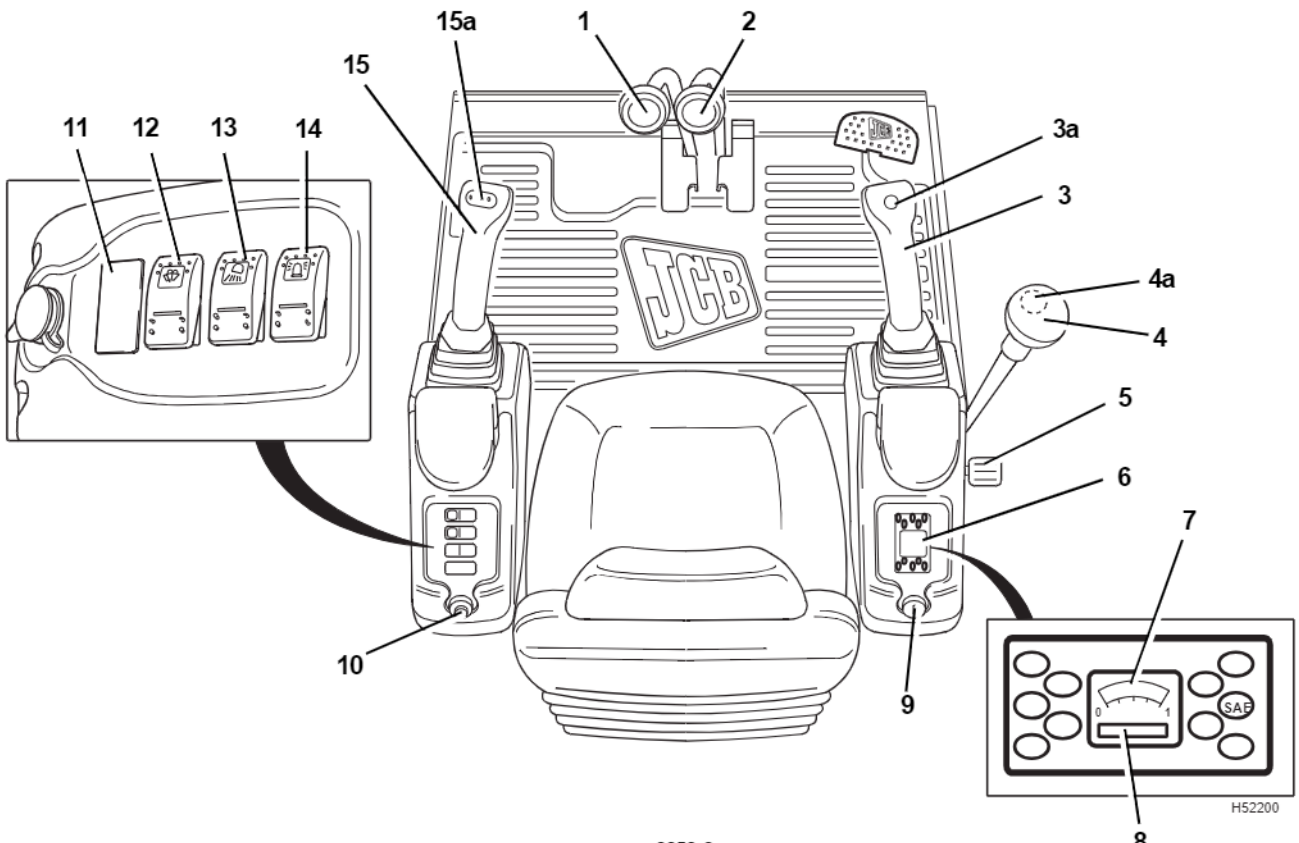
Release the Seat Belt

Press button **C** and pull the recoil side of the belt outwards.

Note: *Your machine is fitted with a seat belt, USE IT!*



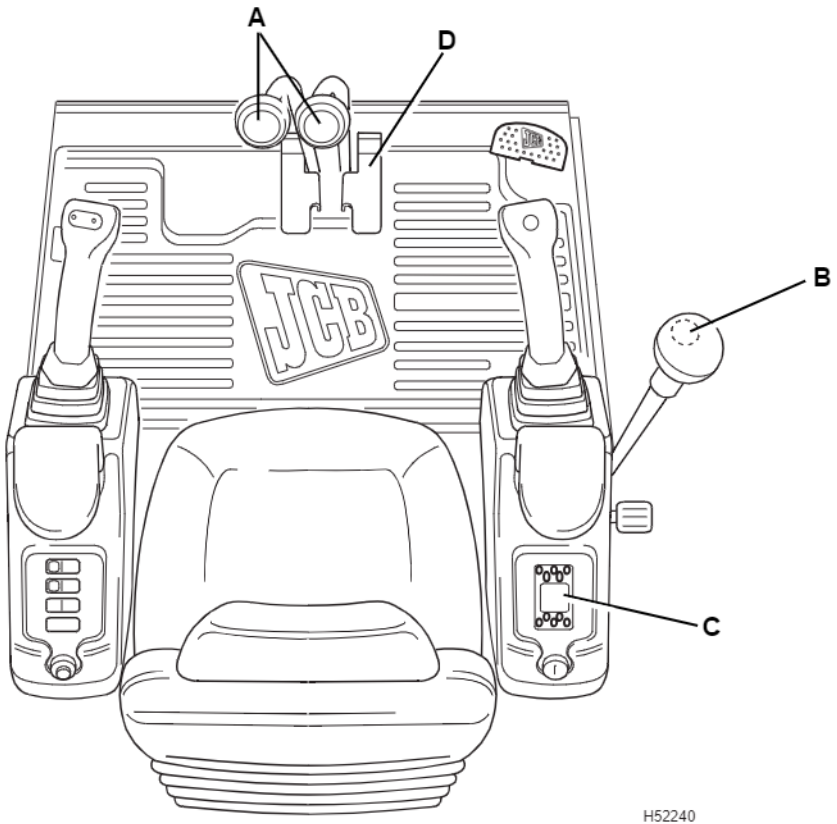
ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

1 Left Track Control Lever
2 Right Track Control Lever
3 Right Hand Controller
3a Horn Button
4 Dozer Lever
4a Two speed Tracking Switch
5 Hand Throttle Lever
6 Instrument Cluster
7 Fuel Gauge
8 Hourmeter
9 Ignition Switch
10 12V Accessory Power Socket (Beacon etc.)
11 Blank
12 Windscreen Wash/Wipe Switch
13 Work Lights Switch
14 Rotating Beacon Switch
15 Left Hand Controller
15a Slew / Swing Selector Switch (LH Button - Slew / RH Button - Swing)

ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Track Controls

The two tracks are controlled by a pair of control levers **A** in front of the seat. Each lever controls one track and is spring loaded to a central position. In this position the track does not operate. The left side lever controls the left track. The right side lever controls the right track. The two levers can be operated individually or together as necessary to move the machine as required. This can be done using one hand or both, or by using the spring-loaded pedals **D**. An increase in speed can be achieved by operating the push button switch **B** located in the dozer lever. When high speed is selected indicator **C** will illuminate.

WARNING

Make sure that all persons are clear before moving.

WARNING

The track controls operate as described when the dozer is located in front of the windscreen. If the dozer is positioned behind the cab, the lever operation will be reversed. It is advisable when tracking to always position the dozer to the front of the machine.

Forward

To move the machine forward, push both levers forward. Release the levers to stop.

Reverse

To move the machine backward, pull both levers backward. Release the levers to stop.

Turn

To turn the machine whilst travelling, move the lever back towards the central position on the side towards which you want to go e.g. move the left lever back to turn left. This causes one of the tracks to move slower than the other. The faster moving track will push the machine around. Release the lever to stop.

Spin

To spin the machine around though 360°, without moving it, operate one lever, in a forward position and the other in a reverse position. This will cause the tracks to drive in opposite directions and hence push the machine around.

ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Engine Controls

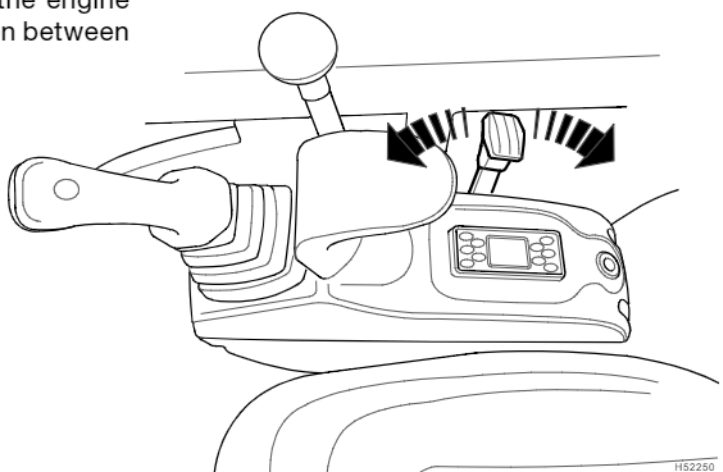
Engine Speed

A hand operated throttle lever in the cab, controls the speed of the engine.

Move the lever to increase or decrease the engine speed. The lever can be left in any position between idle and maximum as required.

Engine Start / Stop

To start and stop the engine use the starter switch, see **Switches** on the following page.



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Switches

Starter Switch

This is operated by the starter key. It has four positions. The key can only be removed when in the 'O' position.

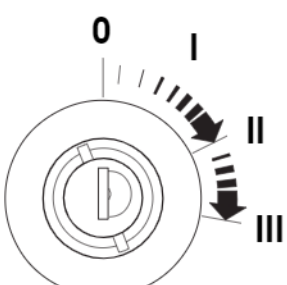
O **Off/Stop Engine**
Turn the key to this position to stop the engine. Make sure the controls are in neutral and the excavator and dozer are lowered before stopping the engine.

I **On**
Turning the key in this position connects the battery to the electrical circuits The key will spring back to this position when released from II.

II **Heat Position**
Holding the key in this position switches on the glow plugs. The glow plugs warm the engine combustion chambers for cold weather starting. Do not hold in this position for more than 15 seconds. The key will spring back to I when released.

III **Start**
Operates the starter motor to turn the engine.

Note: Do not operate the starter for more than 15 seconds at one time.



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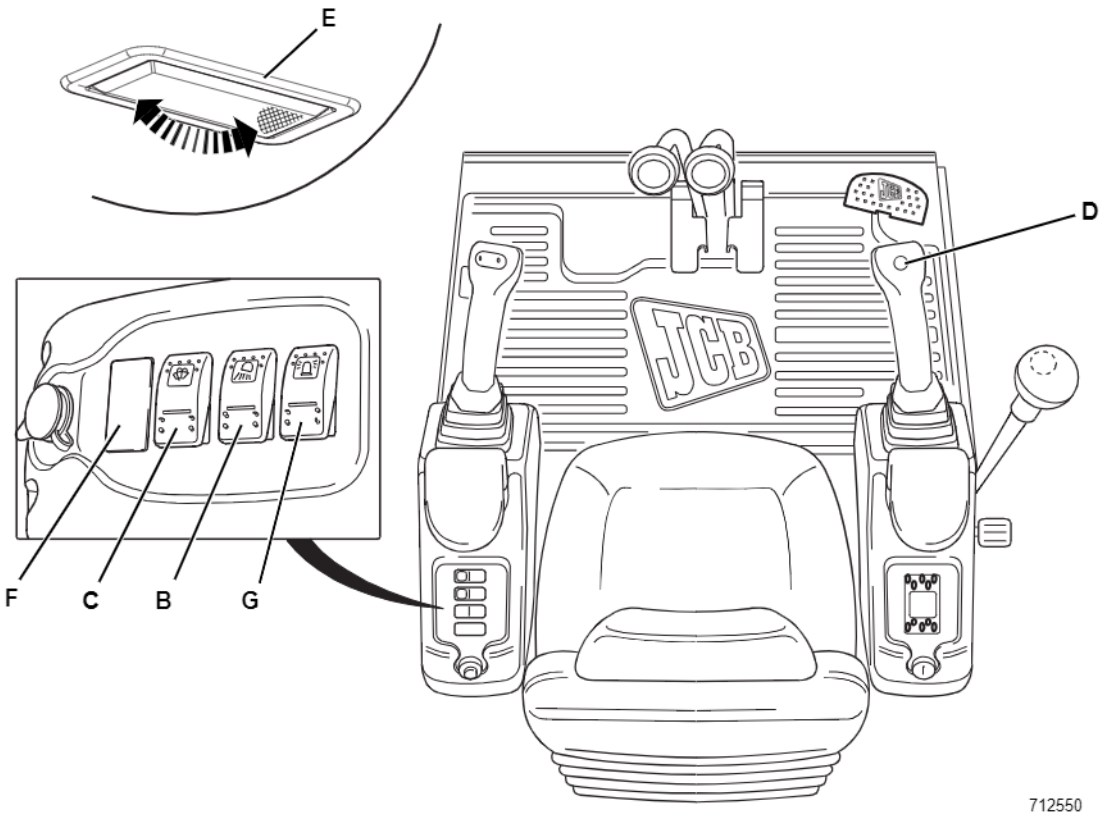
ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Switches - continued

Work Light Switch B

On/Off Switch

Windscreen Wash/Wipe Switch C

Press the switch down once to switch the windscreen wiper On.
Put the switch to the off position to switch Off the windscreen wiper, which will then self park.

To operate the Wash function, press the switch past the wipe position.
Functions only with the starter switch at **I**.

Horn Button D

This is a push button switch located in the R.H. excavator control lever.
Press the switch to activate the horn.

Cab Light E

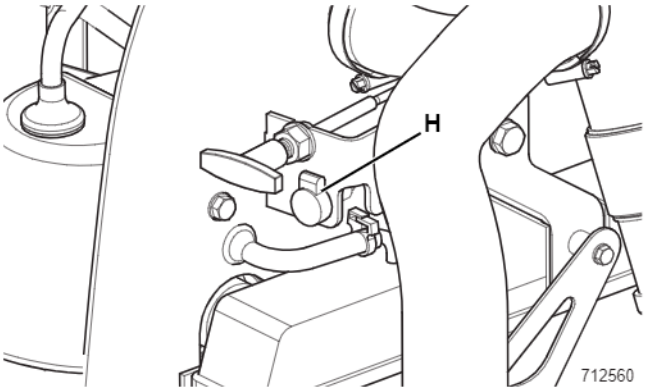
A cab light is situated on the left side of the cab, above the door. It is operated by pressing either end of the light lens.

Blank position F

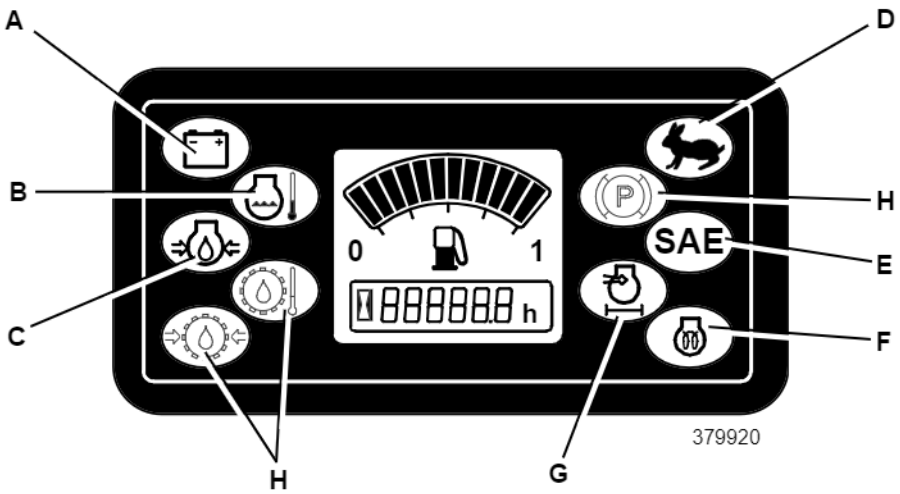
Rotating Beacon Switch G

On/Off Switch
Functions with ignition On or Off

The beacon socket **H** is located in the hydraulic compartment.



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued



ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Instrument Cluster

Indicators for the engine and related systems are mounted in the instrument cluster in the R.H. console.

A **Charge (Fault) Indicaton.**
Indicates Alternator operation, illuminates RED when a Fault occurs.

B **Coolant Temperature (High) Indicator.**
Illuminates RED when coolant temperature is too high.

C **Engine Oil (Low) Indicator.**
Illuminates RED when engine oil pressure is too low.

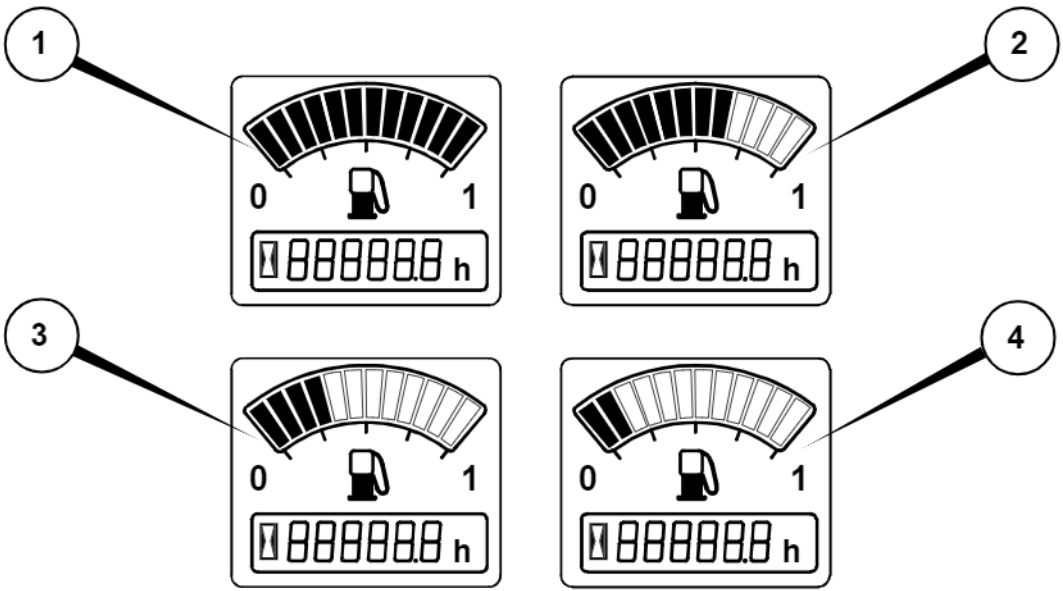
D **Two Speed (High Engaged) Indicator.**
Illuminates GREEN when high speed is engaged.

E **SAE Controls (Selected) Indicator.**
Illuminates Green when SAE control pattern is selected.

F **Glow Plugs (On) indicator.**
Illuminates YELLOW when the Glow Plugs are energised.

G **Air Filter (Blocked) indicator**
Illuminates YELLOW when the Air Filter is Blocked.

H Indicators not fitted on this machine.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ENGINE AND TRACK CONTROLS, SWITCHES AND INSTRUMENTS - continued

Digital LCD Fuel Gauge

Fuel Tank Level Indication

1	**Full Tank**	All bars illuminated. Filler symbol illuminated.
2	**4 bars to Full**	Filler symbol illuminated. All bars illuminated and reducing as level drops ie. 11 bars, 10 bars, 9 bars etc.
3	**4 bar to 3 bar**	Buzzer gives 3 short beeps. Pump symbol starts to flash.
4	**3 bar to 1 bar**	Pump symbol remains flashing 1 bar illuminated (nearly empty) 0 bars illuminated (tank empty).

Note: *The flashing of all fuel level bars and the filler pump symbol, indicates a fault in the fuel sender circuit. Contact your JCB dealer.*

Audible Warnings

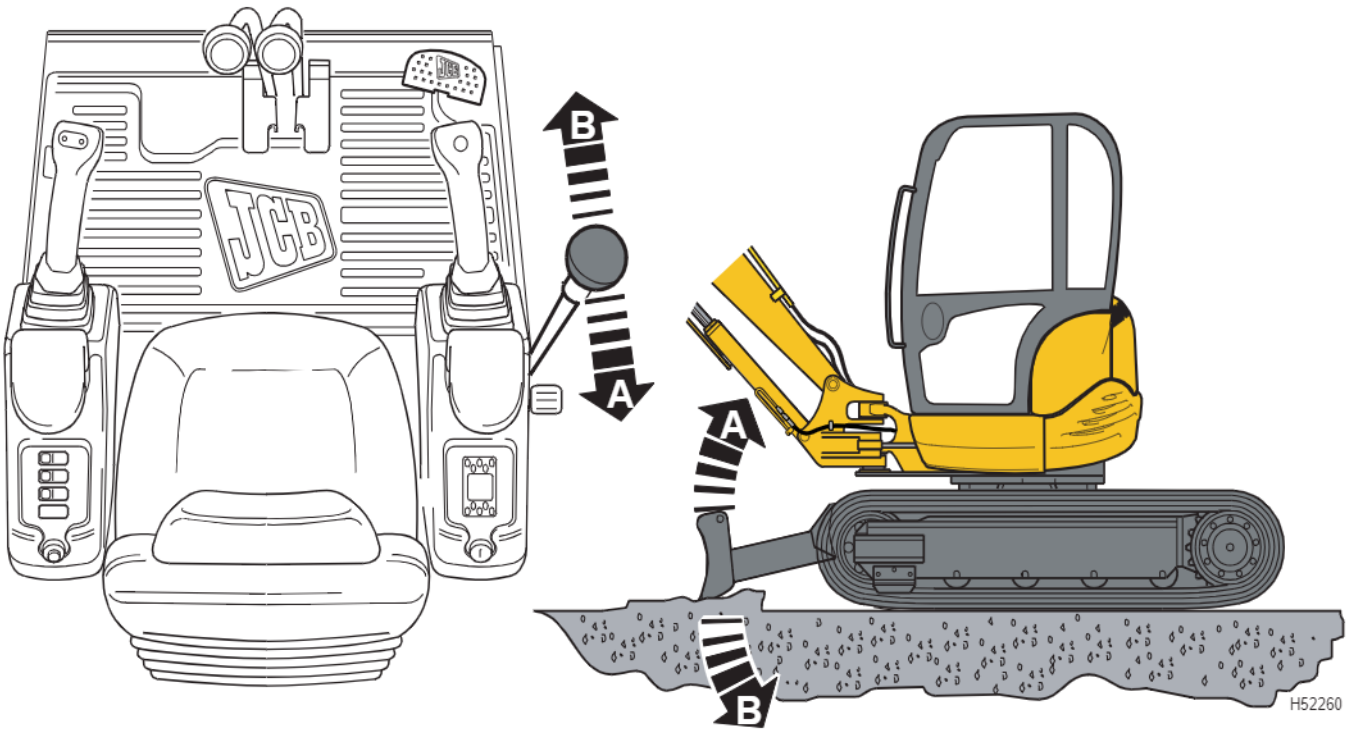
A buzzer will sound if any of the following display a machine fault.

A Charge indicator
B Coolant indicator
C Engine oil pressure indicator
G Air Filter indicator
(see instrument cluster illustration)

If the fault is ignored the buzzer will sound continuously for 180 seconds, after which it will sound intermittently, 1 second on, 2 seconds off.

Switch the ignition off, to reset all operations.

DOZER CONTROLS



DOZER CONTROLS - continued

The dozer is operated by a single control lever on the right side of the cab. This lever is spring loaded to the central position. In this position the dozer will not move.

CAUTION

Before operating the dozer, make sure that large rocks or other objects are not between it and the tracks that can jam the mechanism. HOP34

CAUTION

Before stopping the engine lower the dozer blade to the ground. HOP35

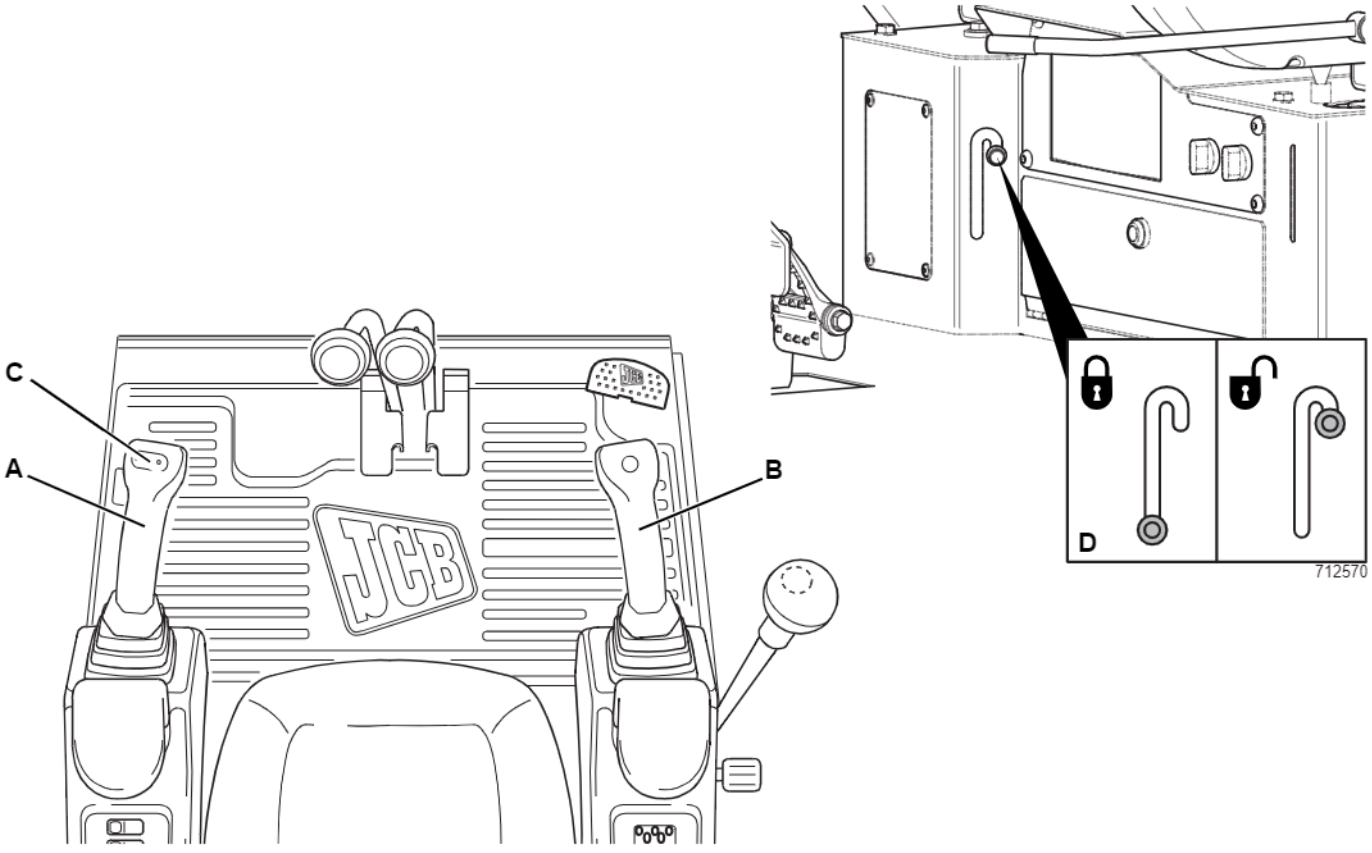
Raise Dozer 'A'

To raise the dozer pull the lever backward. At the required position release the lever.

Lower Dozer 'B'

To lower the dozer push the lever forward until an increased resistance is felt and the blade moves. At the required position release the lever.

EXCAVATOR CONTROLS



EXCAVATOR CONTROLS - continued

The slew lock **D** is situated in the seat base. Ensure it is UNLOCKED before operating the excavator controls.

The excavator controls consist of those levers which operate the boom, dipper and bucket and swing the machine.

There are two excavator controllers **A** and **B** which control all the functions. The controls are situated in the operators seat armrests. Raising the left armrest when leaving the cab prevents the services operating. When re-entering the cab, ensure the armrest is replaced firmly to ensure correct operation.

The left side controller **A** controls excavator swing and cab slew, via a selector switch **C** in the controller, it also controls dipper functions.
The right side controller **B** controls boom and bucket functions as standard.

It is possible to specify SAE style operating functions i.e. left controller **A** controlling swing/slew and boom. The right hand controller **B** controlling dipper and bucket operation. Both controllers are spring loaded to the central position. In this position related services will not operate.

Most excavating movements are achieved using a combination of both controllers at the same time. Practise such movements until you are familiar with the operations that can be achieved safely.

WARNING

When using the boom and dipper fully extended, take the following precautions, otherwise the machine could get damaged or become unstable and a danger to you and other people.
Make sure you do not exceed the working capacity of the boom at maximum reach.
Swing the boom slowly to prevent any chance of the machine becoming unstable. For the same reason avoid dumping downhill if possible.
HOP36

CAUTION

Do not excavate on hard or rocky ground with the boom set diagonally across the undercarriage. This induces a rocking motion that can cause damage to the track gearbox sprockets and tracks.
HOP37

EXCAVATOR CONTROLS - continued

Before slewing the mainframe ensure the slew lock is disengaged, (the up position).

The slew function is selected by operation of a single switch **A** in the left hand controller **B**.

The control will always default to slew function when the ignition is switched off.

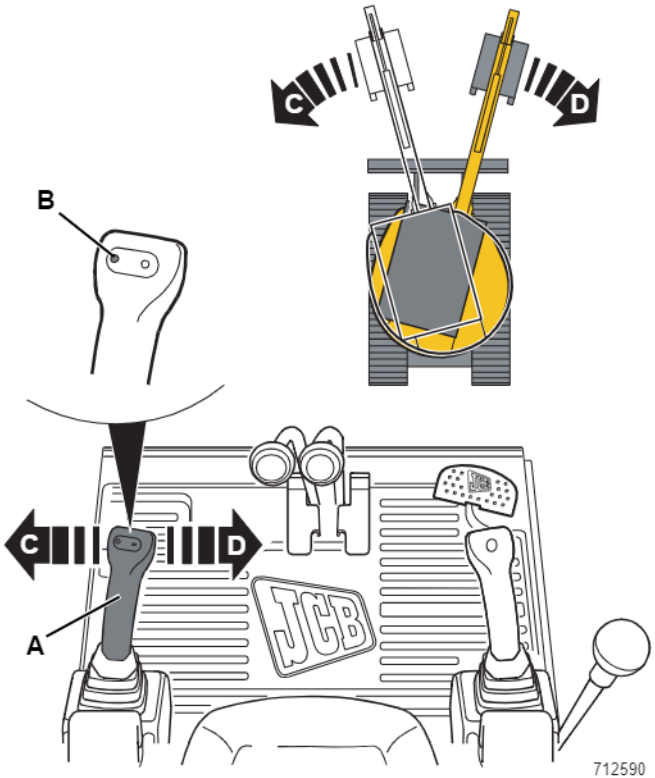
The machine should be set for slew operation. Ensure you are in slew mode by operating the left hand control lever and noting the movement.

Slew mainframe left

To slew the cab to your left, move the left controller to the left **C**. Release the controller when you have moved to the desired position.

Slew mainframe right

To slew the cab to your right, move the left controller to the right **D**. Release the controller when you have moved to the desired position.



EXCAVATOR CONTROLS - continued

To select swing press button **A** on left hand controller **B** once.

Swing boom left

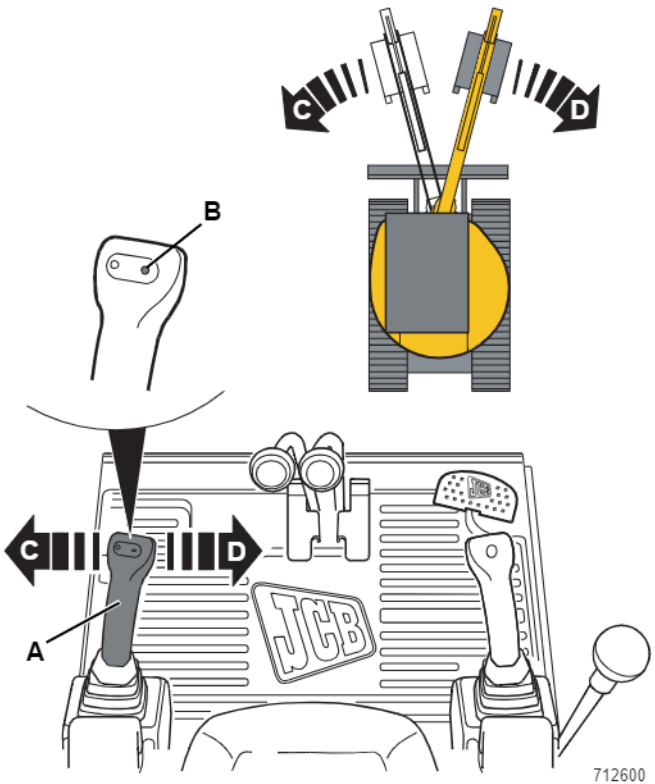
To swing the boom to your left, move the left controller to the left **C**. Release the controller when you have reached the desired position.

Swing boom right

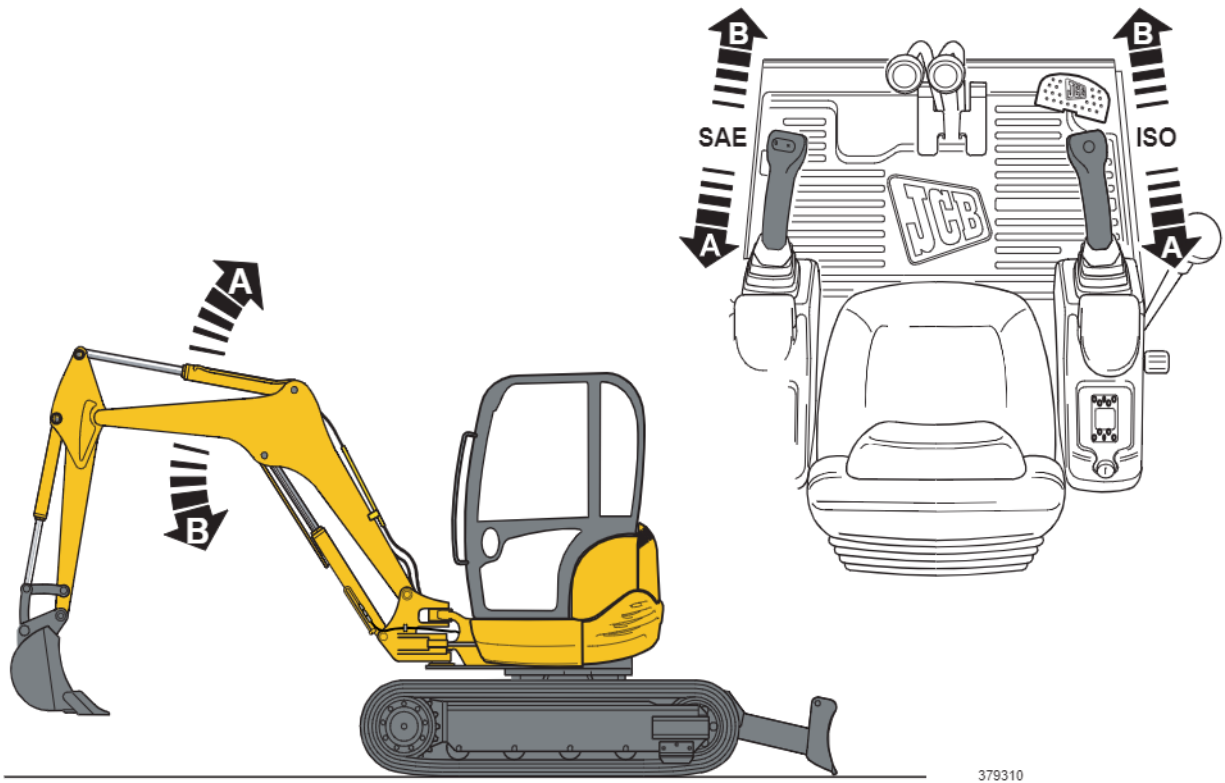
To swing the boom to your right, move the left controller to the right **D**. Release the controller when you have reached the desired position.

CAUTION

When the requirement for boom swing has finished, position boom to the straight ahead configuration and reset machine to 360 deg. slew by pressing the button on the left hand controller once.



EXCAVATOR CONTROLS - continued



EXCAVATOR CONTROLS - continued

WARNING

Thoroughly warm the hydraulic oil before operating the excavator services. To ensure smooth boom operation damping is incorporated into the boom lift circuit, this means when boom raise is released, the boom may continue to rise for a fraction of a second if the oil is not at the correct operating temperature. Before selecting boom up, check there are no overhead obstructions or electric power cables.

CAUTION

The boom service is operated by the R.H. controller on standard ISO control machines or by the L.H. controller on the optional SAE control pattern machines.

HOP41

Raise Boom

To raise the boom pull the respective controller backwards **A.** Release the controller when the boom has reached the desired position. The boom ram incorporates damping at the limit of boom raise, reducing the speed of the ram, eliminating shock loadings.

Boom Boost

Partial selection of the controller will limit the speed of boom raise. Boom Boost is automatically engaged when controller is fully selected.

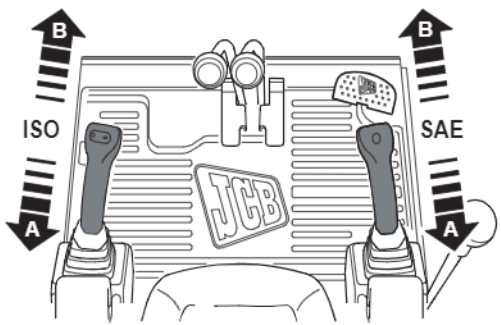
Lower Boom

To lower the boom, push the respective controller forwards **B**. Release the controller when the boom has reached the desired position.

EXCAVATOR CONTROLS - continued

CAUTION

The dipper service is operated by the L.H. controller on standard ISO control machines or by the R.H. controller on the optional SAE control pattern machines. HOP42

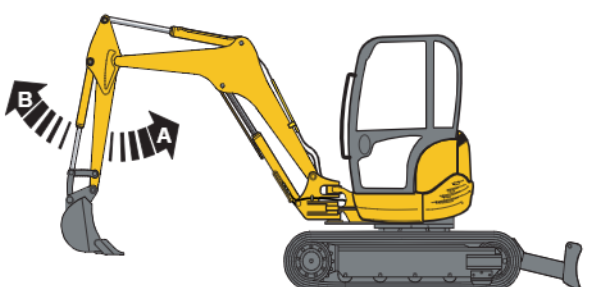


Dipper In

To bring the dipper in, pull the respective controller backward **A**. Release the controller when the dipper is at the desired position.

Dipper Out

To push the dipper out, push the respective controller forward **B**. Release the controller when the dipper is at the desired position.



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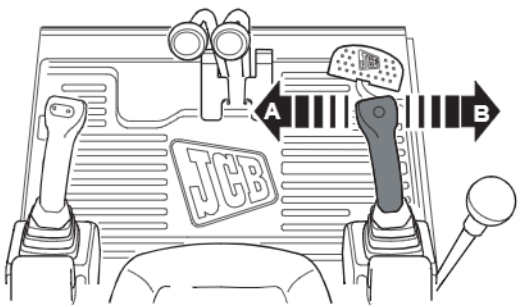
EXCAVATOR CONTROLS - continued

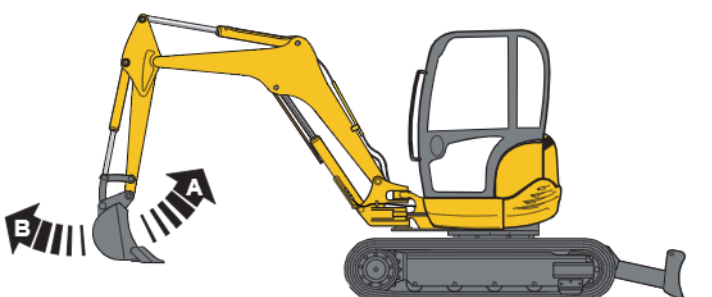
Close Bucket

To close the bucket (to gather a load), move the right controller to the left **A**. Release the controller when the bucket is closed sufficiently.

Open Bucket

To open the bucket (to dump a load), move the right controller to the right **B**. Release the controller when the bucket is open far enough.





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REFUELLING THE MACHINE

WARNING

Diesel fuel is flammable. Keep flames away from the machine. DO NOT smoke while fuelling the machine or working on the engine. Do not refuel with the engine running. There could be a fire and injury if you do not follow these precautions. INT-3-2-2

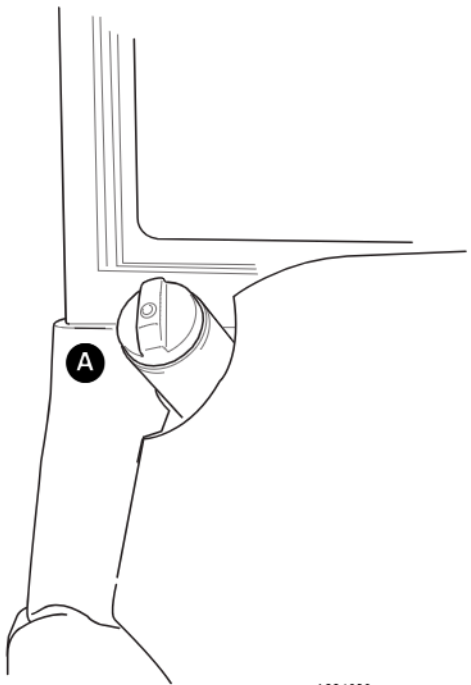
CAUTION

Spilt fuel may cause skidding and therefore accidents. Clean any spilt fuel immediately.

Do not use fuel to clean the machine.

When refuelling, unlock and remove filler cap **A**, (choose a well aired and ventilated area), add the amount of fuel required, replace filler cap and lock the cap in place.

At the end of every working day, fill the tank with the correct type of fuel. This will prevent overnight condensation from developing in the fuel. Do not fill the tank completely, leave some space to allow the fuel to expand



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BEFORE STARTING THE ENGINE

Note: *Read Operating in Low Temperatures or Operating in High Temperatures in operation section if you will be using the machine in very hot or cold climates.*

WARNING

Before lowering the attachments to the ground, make sure that the machine and the area around it are clear of other people. Anyone on or close to the machine could fall and be crushed by the attachments, or get caught in the linkages.

HOP43

1 Lower the attachments to the ground.

Lower the excavator bucket and dozer to the ground, if they are not already there. They will lower themselves under their own weight when you operate the controls. Operate the controls carefully to control the rate of descent.

2 Do a pre-start inspection.

For your own safety (and others) and for a maximum service life of your machine, do a pre-start inspection before starting the engine.

a If you haven't already done it, do a walkround inspection of the outside of the machine. *See Before Entering the Cab* in operation section.

b Remove dirt and rubbish from the cab interior, especially round the pedal and control levers.

c Remove oil, grease and mud from the pedals and control levers.

WARNING

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

HOP44

d Make sure that your hands and shoes are clean and dry

BEFORE STARTING THE ENGINE - continued

WARNING

Loose articles can fall and strike you or roll on the floor. You could be knocked unconscious, or the controls could get jammed. If that happens you will lose control of the machine.

HOP45

e Remove or secure all loose articles in the cab, such as lunch boxes, tools etc.

f Check round the cab for loose or missing bolts, screws etc. Fit new ones or tighten where necessary.

g Inspect the seat belt and its mountings for damage and excessive wear.

h Check that the following are in working order: Lights, Horns all Switches and Wiper

j Check the excavator lever gaiters are not damaged or loose, replace or secure as required with new fasteners.

3 Adjust the Seat

Adjust the seat so that you can comfortably reach all driving controls. You should be able to operate the control pedal with your back against the seat back.
Ensure the seat locking lever has engaged fully.

4 Set the Hand Throttle Lever

Set the hand throttle lever to idle.

STARTING THE ENGINE

1 Start the engine

Move the throttle lever to half speed position. Turn the starter key to the glow plug position **II** for approximately 6 seconds to warm the engine combustion chambers.

***Note**: Outside temperatures below 0° C (32° F) will require extended times.*

Turn the starter key further to position **III** and hold it there until the engine starts; do not exceed 15 seconds. If the engine does not start, return to the OFF position. Allow the starter to cool for a few minutes before repeating step **1**.

2 Check the indicators

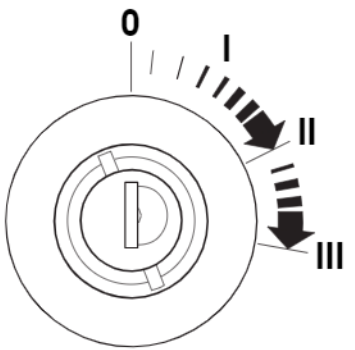
CAUTION

Once the engine has started, move the throttle lever to the idle position. Check that all the warning lights have gone out. Do not race the engine until the 'oil pressure low' light has extinguished.

If any indicator fails to extinguish, or if they illuminate while the engine is running, make the machine safe, stop the engine and investigate the cause. HOP46

3 Warm up the engine and hydraulics

Allow the engine to warm up at idle speed for five minutes. If the engine has been jump-started, remove the booster cables (see jump starting the engine). Operate the excavator a few times to help warm up the hydraulic system.



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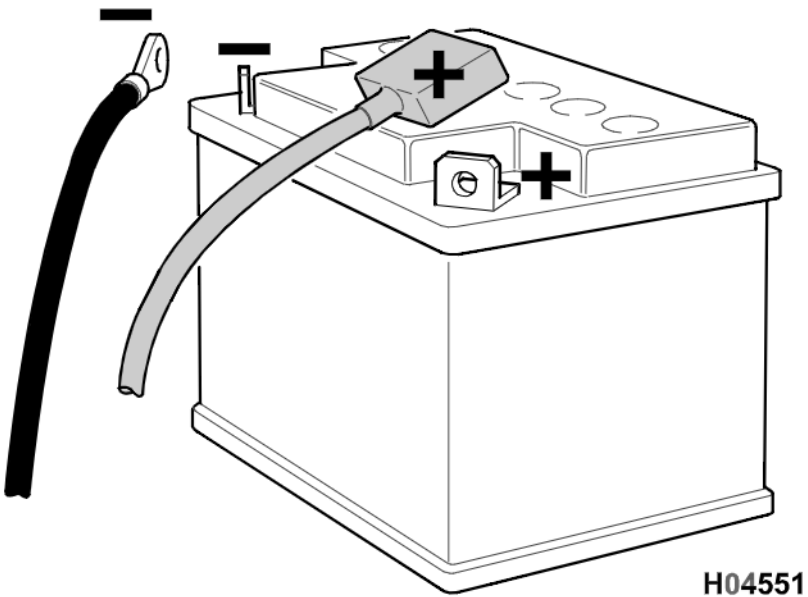
JUMP STARTING THE ENGINE



JUMP STARTING THE ENGINE - continued

Note: *Read battery pages in the Maintenance section of this handbook before carrying out any work with the battery.*

Follow the instructions on this and the following page to start the engine using booster cables. Your machine has a 12 V starting system. The negative (-) terminal on the battery is connected to frame earth.

WARNING

If you try to charge a frozen battery, or jump start and run the engine, the battery could explode. Do not use a battery if its electrolyte is frozen. To prevent the battery electrolyte from freezing, keep the battery at full charge.

WARNING

Before lowering the attachments to the ground make sure the machine and the area around it are clear of people. Anyone on or close to the machine could fall and be crushed by the attachments, or get caught in the linkages.

HOP43

1 Lower the Attachments to the Ground

Lower the excavator bucket and dozer to the ground. If they are not already there. They will lower themselves under their own weight when you operate the control. Operate the control carefully to control the rate of descent.

2 Set all Switches in the Cab to Off

CAUTION

The booster supply should not be higher than 12 V. Using a welder or higher voltage supply will damage your machine's electrical system.

CAUTION

Do not connect two batteries together to give 24 V. This could burn out the glow plugs and damage the starter motor.

3 Remove the left hand mainframe skirt to gain access to the battery.

JUMP STARTING THE ENGINE - continued

4 Connect the Booster Cables

a Remove battery cover if fitted.

b Connect the positive booster cable to the positive (+) terminal on the machine battery. Connect the other end of this cable to the positive (+) terminal of the booster supply.

c Connect the negative (-) booster cable to a good frame earth on the machine, away from and below the battery.

Note: *A good frame earth is part of the machine frame, free from paint and dirt. Do not use a pivot pin for an earth.*

d Connect the other end of this cable to the negative (-) terminal on the booster supply.

5 Do the pre-start Checks

See before starting the engine

6 Start the Engine - see *Starting the Engine*

7 Disconnect the Booster Cables

a Disconnect the cable from the machine frame earth, then disconnect if from the booster supply.

b Disconnect the positive booster cable from the positive (+) terminal on the battery, then disconnect it from the booster supply.

8 Fit battery cover (if required).

9 Refit items removed to gain access to the battery.

WARNING

Keep metal watch straps and any metal fasteners on your clothes, clear of the positive (+) battery terminal. Such items can short between the terminals and nearby metal work. If this hapens you can get burned.

Make sure that the fuel filler cap is tightly fitted. Make sure that all spilt fuel is cleaned away from the battery area.

HOP48

COLD CLIMATE WARM UP

Before starting work in temperatures below -15 °C (5 °F), hydraulic fluid must be warmed.

1 Warm up Engine

After starting the engine (see starting engine) set the throttle lever to mid position and run for 10 minutes.
DO NOT operate any services. After the warm up period make sure that everyone is clear of the machine.

2 Warm up Hydraulic Oil

a Increase engine speed to maximum. Warm the hydraulic oil by repeatedly selecting bucket crowd by moving the right hand lever to the left for 5 seconds. Repeat for several minutes.

b Select dozer up by moving dozer control lever backwards, keep selected for one minute.

3 Warm up Hydraulic Circuit

a Reduce engine speed by moving throttle lever to mid position.

b Raise and lower boom from ground level to full height five times.

c Stroke the dipper fully in both directions, five times

d Rotate the bucket fully in both directions, five times

e Swing the upper structure clockwise for one revolution and stop. Swing the upper structure anti-clockwise for one revolution and stop.

f Repeat step 3c three times

4 The machine should now operate correctly. Should operation still appear slow, then steps 3b and 3c may be repeated.

OPERATING IN LOW TEMPERATURES

In low temperature situations, take the following precautions. They will make for easier starting and prevent possible damage to your machine.

1 **Use the correct viscosity engine lubricating oil**

See *Fluids, Lubricants & Capacities* in Maintenance section

2 **Use a low temperature diesel fuel**

If available. See fuel system in Maintenance section

3 **Use the correct coolant mixture**

See *Coolant Mixtures* in Maintenance section

4 **Keep the battery at full charge**

5 **Fill the fuel tank at the end of each work period**

6 **Protect the machine when not in use**

Park the machine inside a building or cover it with a tarpaulin.

7 **Install cold weather starting aids**

In very low temperatures, say -18 °C (0 °F)and below, additional starting aids may be needed. Examples are fuel, oil and coolant heaters and extra batteries.

Ask your JCB Dealer for advice

Note: *Do not connect two batteries in series to give 24 Volts for starting. This could burn out the glow plugs and starter motor.*

8 Remove snow from around the engine cover before starting.

Otherwise snow could get into the air filter.

OPERATING IN HIGH TEMPERATURES

In high temperature situations, take the following precautions to prevent possible damage to the machine.

1 Use the correct viscosity engine oil

See *Fluids Lubricants and Capacities* in *Maintenance* section.

2 Use the correct coolant mixture

See coolant mixtures in Maintenance Publication

3 Check the coolant system regularly

Keep the coolant at the correct level. Make sure there are no leaks.

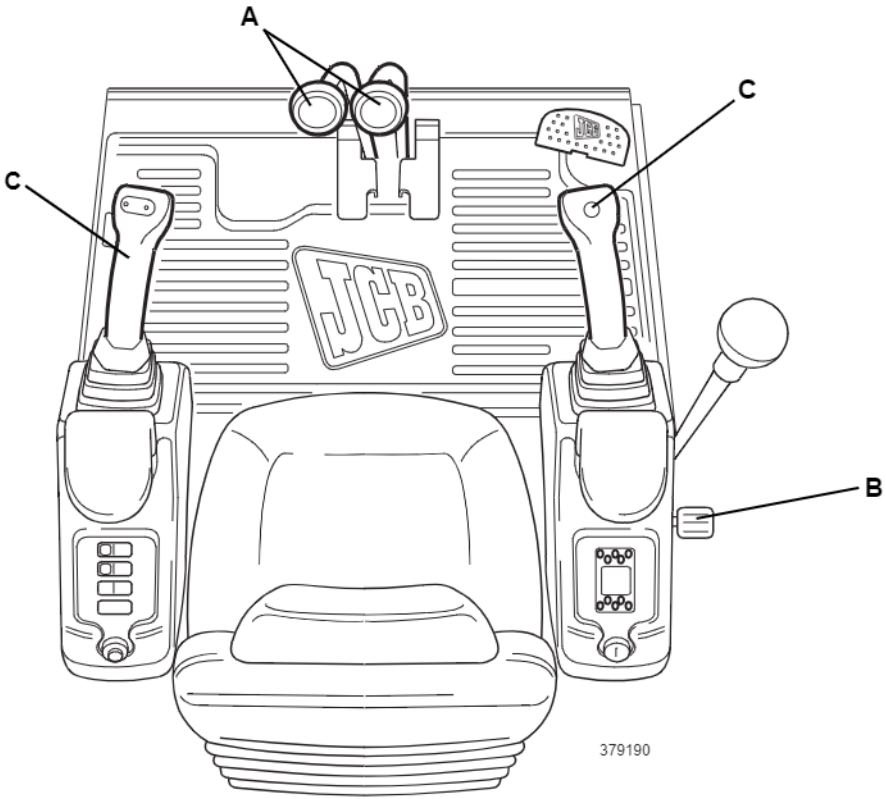
4 Keep the radiator/oil cooler clean

Regularly remove dirt and debris from between the radiator /oil cooler and the engine.

5 Check ventilation grilles

Ensure the ventilation grilles to and from the engine compartment are not blocked.

STOPPING AND PARKING THE MACHINE



STOPPING AND PARKING THE MACHINE - continued

Whenever possible, stop the machine on dry and level ground.

1 Stop the machine

Release the two track levers **A** then push the hand throttle lever **B** to the idle position.

2 Lower the Bucket and Dozer to the ground.

3 Stop the Engine and reset ignition key to position I.

4 Vent the Hydraulic System

Note: *Hydraulic pressure is retained in an accumulator which must be vented when leaving the machine.*

Operate the control levers **C** to vent the hydraulic system residual pressure.

5 Remove the Starter Key

Ensure the waterproof cover is closed on canopy machines.

6 Switch off all unnecessary Switches

If you are leaving the machine, make sure that all switches are set to off.

WARNING

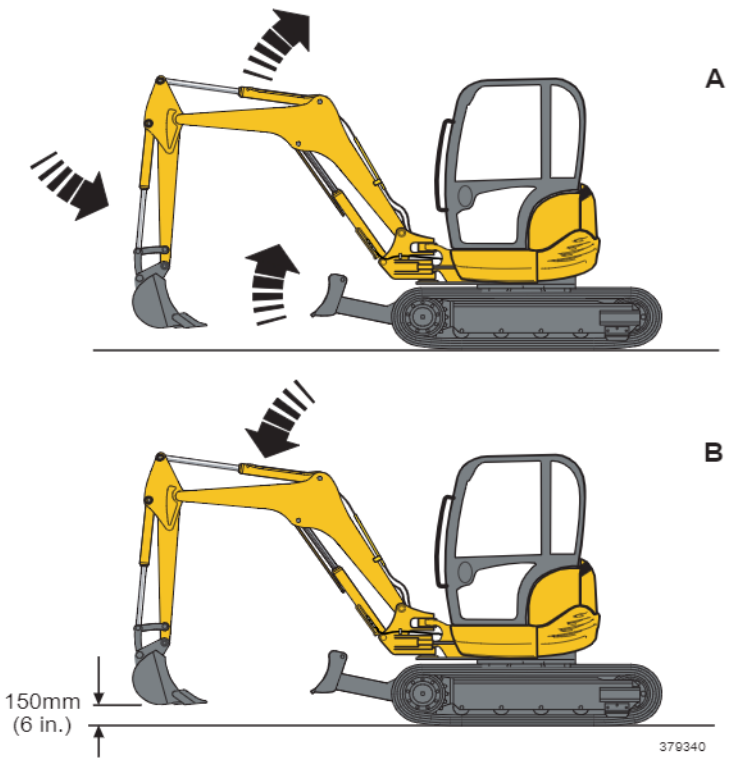
Ensure that the excavator is in a safe condition

HOP49

7 Leave and Secure the machine

Raise the left armrest or engage the lever lock(s). Use the handrail to leave the cab. If you are leaving the machine for a long period, close and latch the window and lock the door. Make sure that the fuel filler cap is locked.

PREPARING FOR SITE TRAVEL



PREPARING FOR SITE TRAVEL - continued

CAUTION

Always travel the machine with the excavator positioned at the same end as the dozer, especially on hard and rocky ground.

Travelling position A
(level site conditions)

(Activate warning beacon if fitted)

Cab facing forward over dozer, excavator as shown, dozer blade fully up.

Position boom fully up, operate dipper fully in and bucket fully crowded, i.e. bucket rotated fully towards cab.

Travelling position B
(uneven site conditions)

(Activate warning beacon if fitted)

Lower the boom so that the bucket or attachment is approximately 150 mm (6 in) from the ground.

GETTING THE MACHINE MOVING

After you have warmed up the engine, move off as described below. Read Operating Procedures and Warnings first.

Operating Procedures

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

Note: *Too low an engine speed may result in lack of dipper control.*

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

Approach deep mud slowly.

⚠ WARNING

You and others could be killed or injured if you reverse direction on the move, because the change in direction will be sudden and without warning to others.

Always slow down and stop gently before changing from forward to reverse or vice versa.

HOP51

GETTING THE MACHINE MOVING - continued

1 Check your seat.

Make sure that the seat is secure and correctly adjusted.
Fasten the seat belt.

2 Mainframe Slew Lock

Make sure that the mainframe slew lock is disengaged.

3 Start the Engine

See starting the engine in Operation section

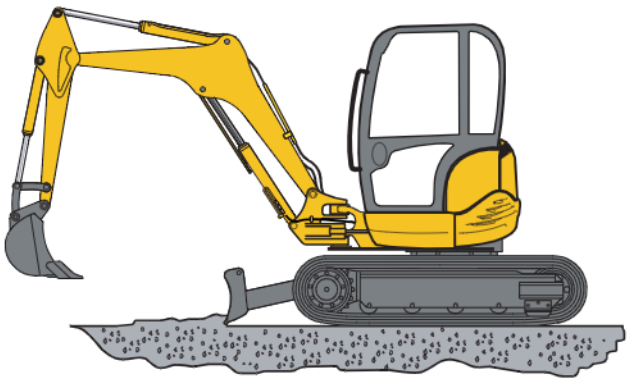
4 Move the machine

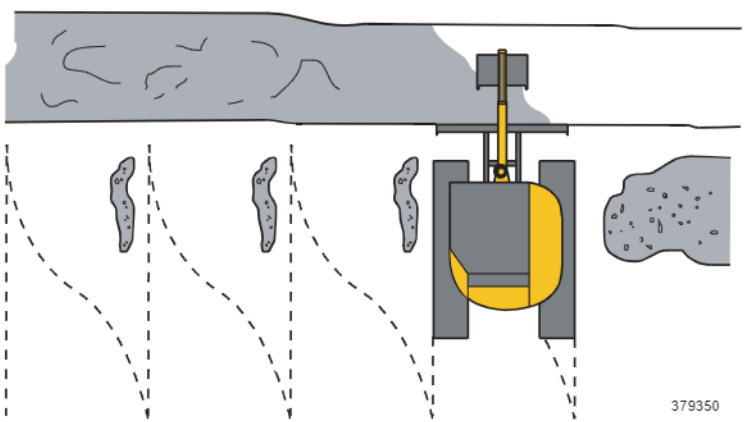
a Check that the attachments are in the travel position. Make sure that it is safe to move off.

b Take hold of both track control levers in one hand

c Move the levers forward or backward as required and pull the throttle lever slowly backward until the desired speed is attained. To increase tracking speed operate the two speed tracking switch. See 'Engine and Track Controls' page.

WORKING WITH THE DOZER





WORKING WITH THE DOZER - continued

Remember that you will be driving the machine while you are using the dozer. Keep alert for bystanders, animals and possible hazards.

Ensure the slew lock is engaged when working with the dozer.

Dozing and Grading

Keep the bottom of the dozer parallel to the ground. When grading a site remove high spots first, then use this soil to fill in troughs. Do not use excessive downward pressure on the dozer or machine traction could be lost. When working with the dozer, set the excavator straight with the machine, as for road travel. Keep the dozer high when travelling as this increases the machines ground clearance.

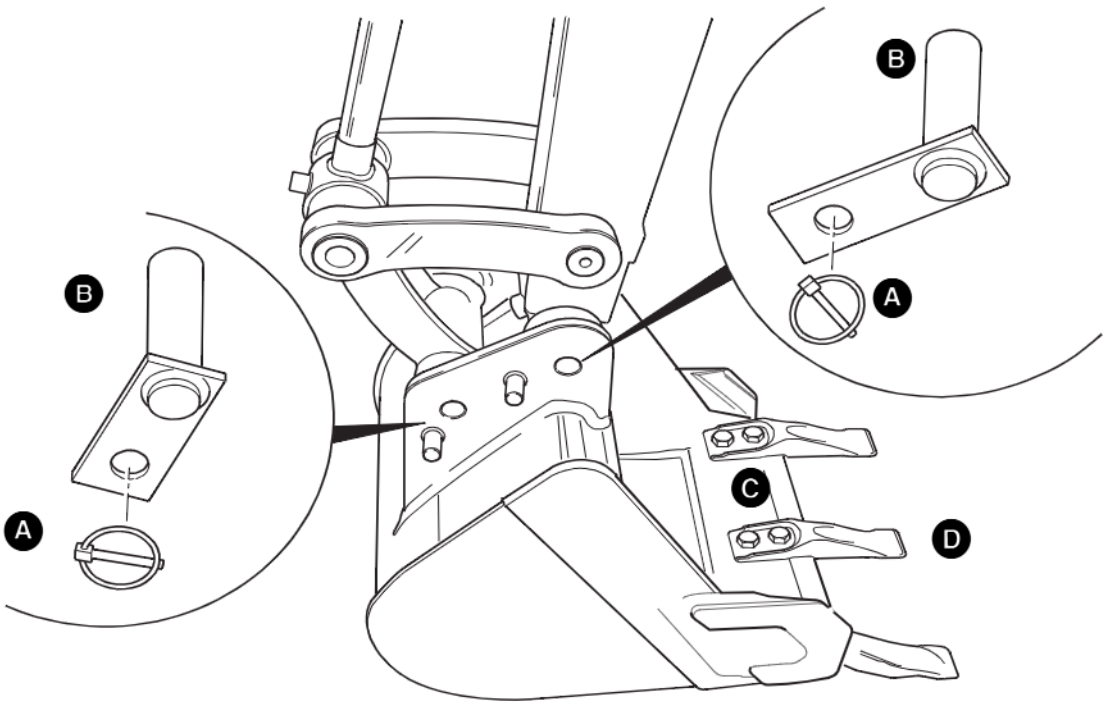
Scraping and Cutting

If a deep cut is to be made, do it in steps of about 50 mm (2 in). Do not forget to adjust the dozer height when the machines tracks enter the cut.

Backfilling

When backfilling on a slope, pile the material on the high side of the trench whenever possible.
Set the dozer level to the ground. Work at right angles to the trench filling a dozer's width at a time. Leave any spillage until the trench is filled. Use the spillage to finish the job by driving the length of the trench with the dozer low to the ground.

WORKING WITH THE EXCAVATOR



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WORKING WITH THE EXCAVATOR - continued

Installing a Bucket - non Quickhitch Models

(See Bucket Selection)

Note: *This job is easier done by two people - one to operate the controls and one to line up the pivots.*

1 Position the Bucket

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

WARNING

DO NOT use your fingers through the holes to align the links

HOP65

2 Engage the Dipper

If necessary move the machine to align the pivot pin holes. Carefully align the holes in the dipper and bucket link with the bucket. Fit the pivot pins **B** and lynch pin **A**.

Replacing Bucket Teeth

1 Position the Bucket

Make sure that the bucket is resting flat on the ground.

2 Switch off the Engine

Remove the starter key.

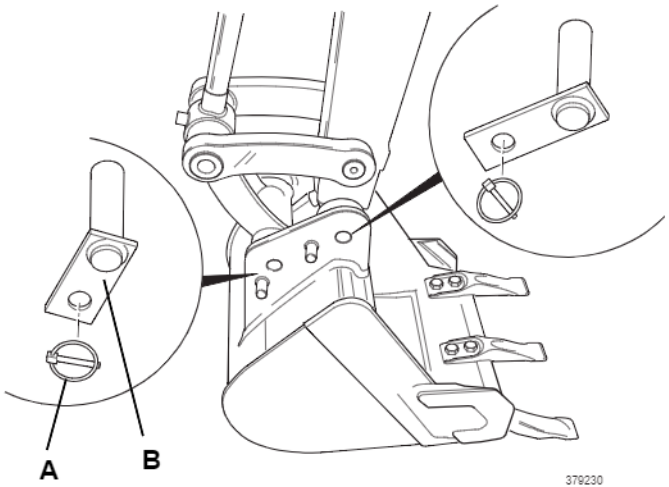
3 Remove a Tooth

Remove the nut and bolt **C** and the tooth **D**.

4 Install a Tooth

Position the tooth **D** and fit the bolts **C**.

WORKING WITH THE EXCAVATOR - continued



Bucket Selection

WARNING

The bucket selected should be the correct width to suit the hole/trench to be excavated. However, if the hole width demands the larger bucket, consideration should be given to the density/weight of the material to be moved affecting the stability of the machine especially if working on a slope. If there is danger of the machine's stability being compromised, then select a smaller bucket or reposition the machine.

Use the 300 mm (12 in) wide bucket for narrow excavations or for maximum penetration when digging in hard, rocky or clay soils.

Larger buckets are ideally suited to bulk shifting light or loose materials.

WARNING

When buckets 750 mm (30 in) or wider are fitted to the machine, use extreme caution in operation to avoid contact with the cab.

WORKING WITH THE EXCAVATOR - continued

Removing a Bucket - non Quickhitch Models

1 Position the Boom

Swing the boom so that it is straight in front of the machine. Rest the bucket on level ground, with the dipper approximately vertical and the bucket flat to the ground. Block the bucket to prevent its movement.

WARNING

Stand clear and to one side of the bucket while the pivot pins are removed: the bucket could roll over.

HOP63

2 Detach the Bucket

Remove the lynch pins **A** and the pivot pins **B.**

WARNING

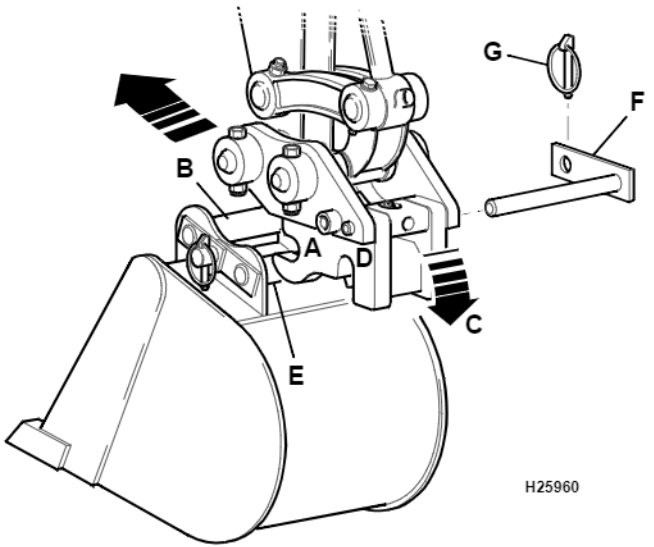
If two people are doing this job, make sure that the person working the controls is competent. A person can be killed or seriously injured if the controls are moved violently or incorrectly.

HOP64

3 Withdraw the Dipper

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

WORKING WITH THE EXCAVATOR - continued



Installing a Bucket on a Quickhitch

(See Bucket Selection)

1 Position the Bucket

Set the bucket on firm level ground. Use safe and correct lifting equipment to move the bucket .

2 Position the Machine

a Position the machine so that the Quickhitch and bucket are correctly aligned for connection as shown.

b Use the excavator controls to engage jaw **A** of the quickhitch with the pivot pin **B** of the bucket.

WORKING WITH THE EXCAVATOR - continued

c Use the excavator controls to roll the Quickhitch in the direction of arrow **C** until the latch hook **D** has fully engaged the pivot pin **E** on the bucket. Due to the light weight of some buckets it may be necessary to apply a load on the bucket teeth to achieve Quickhitch connection.
Alternatively, use the tommy bar to lever the latch off, allowing the attachment pivot pin **E**, to locate in jaw **D** of the Quickhitch.

CAUTION

Make sure that the latch hook has fully engaged.
2-4-4-3

d Fit the latch hook locking pin **F** and secure with lynch pin **G**.

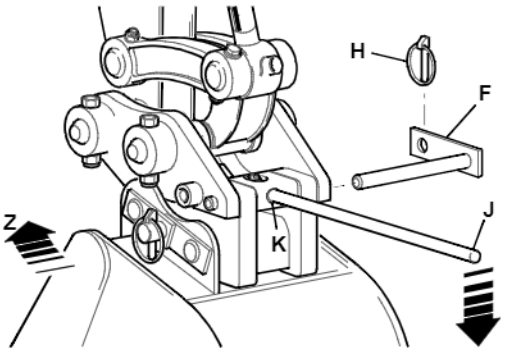
WARNING

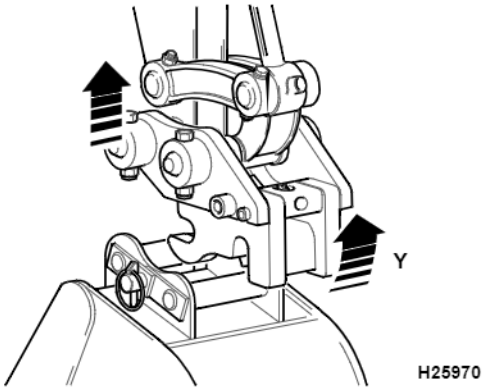
Always fit the Quickhitch latch hook locking pin. Failure to fit the pin will result in possible failure of the latching mechanism. Such a failure would result in the sudden release of an attachment from the machine, you or others could be killed or seriously injured.

CAUTION

When the Quickhitch is installed and its attachment fitted, there is a danger of the attachment hitting the underside of the boom. Operate the boom and dipper carefully when the Quickhitch and its attachment are fitted.
2-4-4-2

WORKING WITH THE EXCAVATOR - continued





WORKING WITH THE EXCAVATOR - continued

Removing a Bucket from a Quickhitch

Note: *Deposit Quickhitch attachments on firm level ground whenever possible. This will make later refitting easy and safe.*

1 Park the machine on firm level ground.

2 Position the bucket so that it is approximately 150 mm (6 in) above the ground.

⚠ WARNING

The attachment will roll forward when released. Stand clear and to one side when releasing the attachment.

2-4-4-1

3 Remove lynch pin **H**, and locking pin **F**.

4 Insert the tommy bar **J** into the hole **K** of the latch hook.

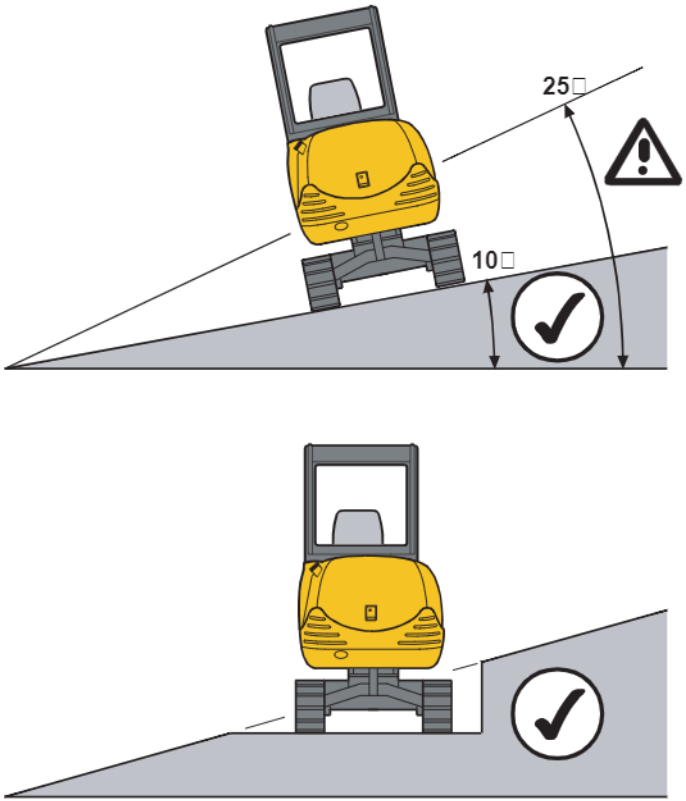
5 Apply a downward pressure on the bar to release the buckets' rear pivot pin from the latch hook, as shown at **Z**. Remove the tommy bar from the Quickhitch.

6 Rest the bucket on the ground.

7 Slowly roll the Quickhitch back and simultaneously raise the dipper arm to release the buckets' front pivot pin, as shown at **Y**.

Note: *Quickhitch procedure applies to most attachments. See your attachments instructions for specific procedures.*

WORKING WITH THE EXCAVATOR - continued



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WORKING WITH THE EXCAVATOR - continued

Working on Slopes

WARNING

Failure to observe these precautions may cause the machine to become unstable and in extreme circumstances will overturn with potential serious injury to the operator.

HOP64

CAUTION

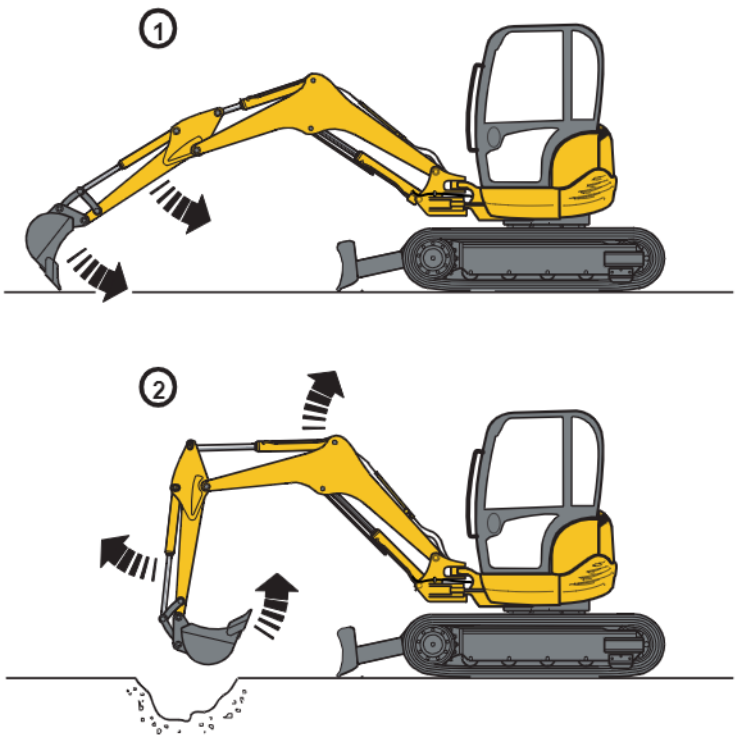
When excavating on level ground, the dozer may be positioned at either end of the machine to improve stability. Always lower the dozer blade to the ground.

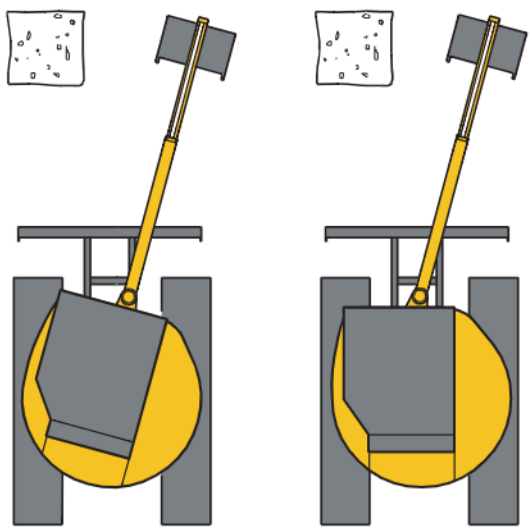
The machine can operate without detriment to its systems on inclines of up to 25°. However, on slopes greater than 10° the operator must use his discretion and proceed with extreme caution.

When working on inclines, position the dozer for maximum stability. This may mean the dozer and the boom are at the same end of the machine, especially if digging down hill, lower the dozer sufficiently to bring the machine level. If necessary, to prevent an instability problem, cut a level platform for the machine to stand on.

Your machine is fitted with a seat belt, USE IT.

WORKING WITH THE EXCAVATOR - continued





WORKING WITH THE EXCAVATOR - continued

Digging

It is possible when excavating, to use either full machine slew when discharging a loaded bucket, or if conditions dictate, swinging the excavator end only to the required dumping area.

1 To start the dig, reach out with the boom and dipper and position the bucket as shown.

Slowly close the bucket at the same time bring the dipper in. Make sure the bucket stays at the same angle to the ground while it travels. If necessary, at the same time apply a downward pressure on the boom, to increase the digging force on the bucket.

2 When the bucket is full, close it fully and at the same time move the dipper out a little way. This will keep soil from building up under the machine.

3 Slew the machine or swing the bucket to the dump area.

Start dumping as the bucket approaches the pile. Do not waste time by dumping too far from the excavation. Dump close to the start dig position. Swing the bucket back to the excavation and start the next dig.

CAUTION

Do not use the side of the excavation to stop the bucket. This could damage the machine and cause the sides of the trench to collapse.

Backfill the excavation by loading the bucket with soil from the pile. Do not push the soil with the side of the bucket.

***Note**: Take extra care if extended swing is utilized (see **Excavator Controls - Extended Operation**).*

WORKING WITH THE EXCAVATOR - continued

Moving the Machine while Digging on the Level

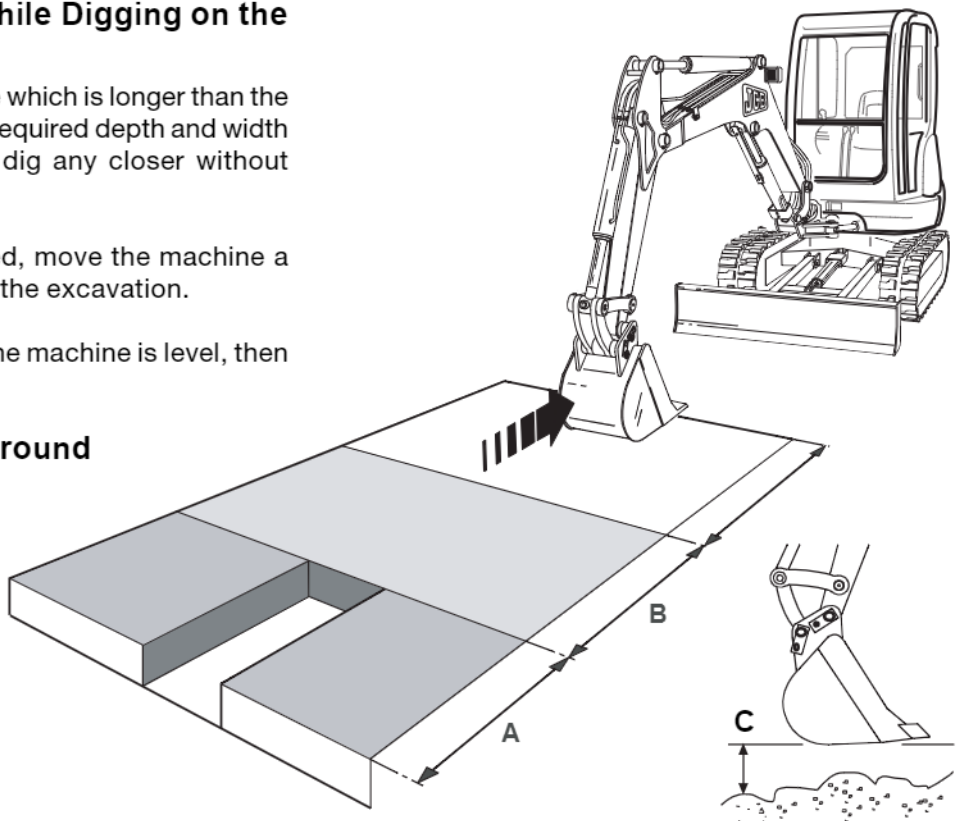
When digging a trench or hole which is longer than the excavator's reach, dig to the required depth and width **A** until it is not possible to dig any closer without contacting the machine.

When this position is reached, move the machine a suitable distance away from the excavation.

Lower the dozer blade until the machine is level, then continue digging **B**.

Tracking on Uneven Ground

As for the travelling position, except that the bucket **C** should be lowered to approximately 150 mm (6 in) above ground.



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WORKING WITH THE EXCAVATOR - continued

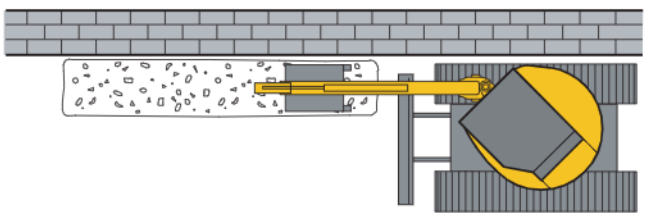
Digging Near Walls

WARNING

When digging near a wall, take care not to undermine the foundations. The wall could collapse.

HOP66

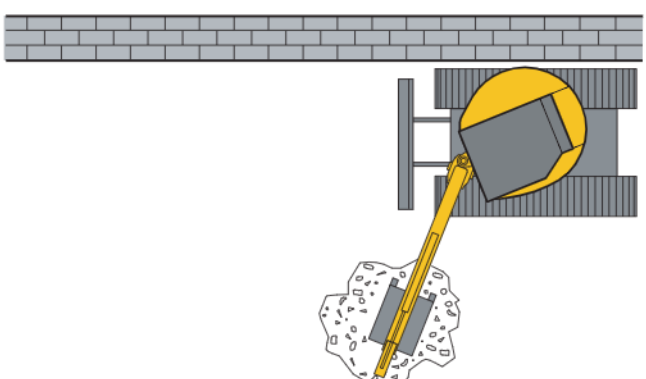
Position the machine close to the wall as shown. Use slew and swing as required to position the bucket for emptying.



Digging up Against Obstructions

1 Swing left or right as required

2 Position the machine so that the bucket is up against the obstruction when fully rotated.



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WORKING WITH THE EXCAVATOR - continued

Lifting (Craning) Regulations and Safe Working Loads

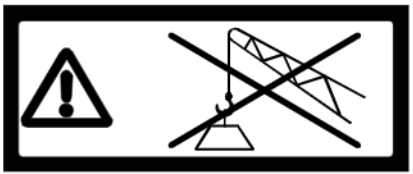
Lifting Regulations

The Factories Act Construction (Lifting Operations) Regulations 1961 defines 'Excavators' as 'Lifting Appliances'. As such the JCB Mini Excavators are subject to these regulations.

The owner and/or operator must make sure that he fully understands the laws and regulations concerning the use of the JCB Excavator. Consult your JCB dealer for further information.

WARNING

Do not use the Excavator as a 'Crane'. Consult National Lifting Regulations.



H19950

WORKING WITH THE EXCAVATOR - continued

Safe Working Loads

WARNING

The safe working load indicated on lifting accessories such as cranes etc. is not the safe working load of the machine.

When lifting loads (stones, soil etc.), the excavator must be fitted with a bucket and the load must be contained within the bucket. Never use the excavator as a crane.

The maximum load which may be lifted depends on the equipment fitted to the excavator and the laws and regulations in force at the time and in the country in which the excavator is being used.

If your machine is equipped to be operated under 'Exemption Certificate' rules, your Exemption Certificate will specify the Safe Working Loads.

Note: *In certain countries Safety Regulations in force call for the application of specific safety factors. Consult your dealer for information.*

USING THE ATTACHMENTS AND SITE SAFETY

This section explains some techniques for efficient and safe use of the machine and its attachments. Attention is also drawn to the various safety aspects of operating on site. Read and understand this section before you start working with the machine. Practice using the attachments until you are completely familiar with the controls and what they do.

Before using the attachments, study the lifting and digging diagrams in the Specification section of the maintenance publication.

Before you start using the machine, tell your workmates what you will be doing and where you will be working. On a busy site, use a signalman.

Remember that your machine is mobile. Whenever possible, maneuver your machine into a position which combines safety with efficiency. If you have to choose remember that

SAFETY MUST COME FIRST!

Choose the correct attachment for the job. Do not use an oversize bucket for rocky material. It could overload the system and shorten service life.

WARNING

General site safety

Before you start using this machine, inspect the job sites. You could be killed or injured if the ground gives way under your machine or if piled material collapses onto it. Check for potholes and hidden debris, logs, ironwork etc. Any of these could cause you to lose control of your machine.

HOP52

CAUTION

Legal liability

You and/or your company could be legally liable for any damage you cause to public utilities. Make sure that you know the locations of all public utility cables or pipes on the site which could be damaged by your machine.

HOP53

USING THE ATTACHMENTS AND SITE SAFETY - continued

WARNING

Electrical power cables

You could be electrocuted or badly burned if you get the machine or its attachments too close to electrical power cables.

You are strongly advised to make sure that the safety arrangements on site comply with the local laws and regulations concerning work near electric power lines.

HOP54

WARNING

Buried electric power cables

Before you start using the machine, check with your electricity supplier if there are any buried power cables on the site. HOP55

WARNING

Overhead electric power cables

There is a minimum clearance required for working beneath overhead power cables. You must obtain details from you local electric company. HOP56

WARNING

If you will be working with a labourer, make sure that you both understand what each other will be doing. Learn and use the recognised signalling procedures. Do not rely on shouting he will not hear you! HOP58

USING THE ATTACHMENTS AND SITE SAFETY - continued

WARNING

Underground gas pipes

Before you start using the machines, find out from your local gas company if there are any buried gas pipes on the site.

Some modern gas pipes cannot be detected by metal detectors. So it is essential that you get an accurate map of buried gas pipes before you begin any excavation work.

Hand-dig trial holes to obtain precise pipe locations. If you find any cast iron pipes, assume they are gas pipes until you can prove otherwise.

Older gas pipes can be damaged by heavy vehicles driving over this ground above them. Mechanical digging must not take place within 500 mm (20 in) of a gas pipe. Leaking gas is highly explosive.

If a gas leak is suspected, contact the local gas company immediately and warn everyone on the site. Ban smoking, ensure that all naked lights are extinguished and switch off any engines which may be running.

You are strongly advised to make sure that the safety arrangements on site comply with the local laws and regulations concerning work near buried gas pipes.
HOP57

USING THE ATTACHMENTS AND SITE SAFETY - continued

CAUTION

Do not travel with the track motors leading particularly on hard and rocky ground. The recoil units will not absorb the shocks and damage could result to the track running gear.

Do not excavate on hard or rocky ground with the boom positioned diagonally across the undercarriage. This can produce a rocking motion that could cause damage to the track gearbox sprockets.

WARNING

Hill sides

Operating on hillsides can be hazardous, especially moving across a slope. If the slope is too steep, your machine could roll over. If you must drive across a slope keep the attachments close to the ground. Remember that loose surface material and mud will change the ground conditions. In any event do not drive across a slope of greater than 17 deg.

WARNING

Reworking old sites

There could be hazardous materials such as asbestos, poisonous chemicals or other harmful substances buried on the site. If you uncover any containers or if you see any signs of toxic waste, stop the machine and inform the site manager immediately.

WARNING

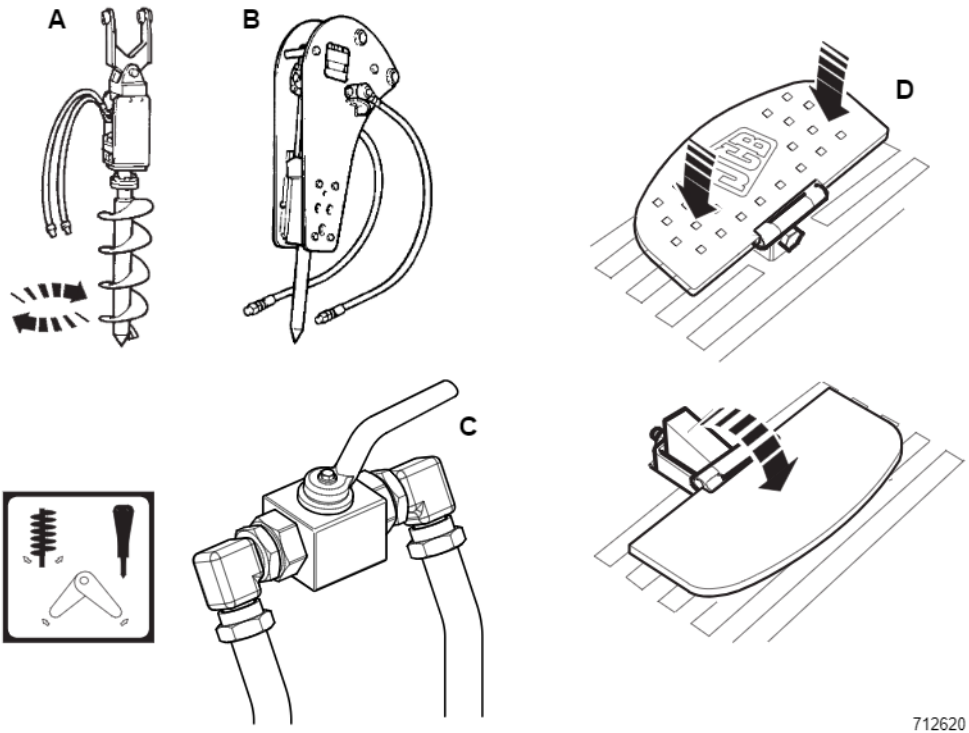
Water supplies and drains

Before you start using the machine, check with your local public water company if there are buried pipes and drains on the site. If there are, obtain a map of their locations and follow the advice given by the water supplier.

You are strongly advised to make sure that the safety arrangements on site comply with the local laws and regulations concerning work near buried water pipes and drains.

HOP62

USING THE ATTACHMENTS AND SITE SAFETY - continued



USING THE ATTACHMENTS AND SITE SAFETY - continued

There are two types of hydraulic attachment circuits available. Single acting or double acting. Both types are operated by a floor mounted pedal.

Single Acting Circuit

This type powers a dipper mounted breaker **A**.

Double Acting Circuit

This type powers reversible attachments such as an auger **B**. The double acting circuit can be switched to single acting operation by means of a valve **C** located above the valve block. Rotate the valve fully counter clockwise for single acting operation or fully clockwise for double acting operation.

Operate the pedal in the required direction for correct tool operation. In non-operating conditions the pedal must be locked in position **D**.

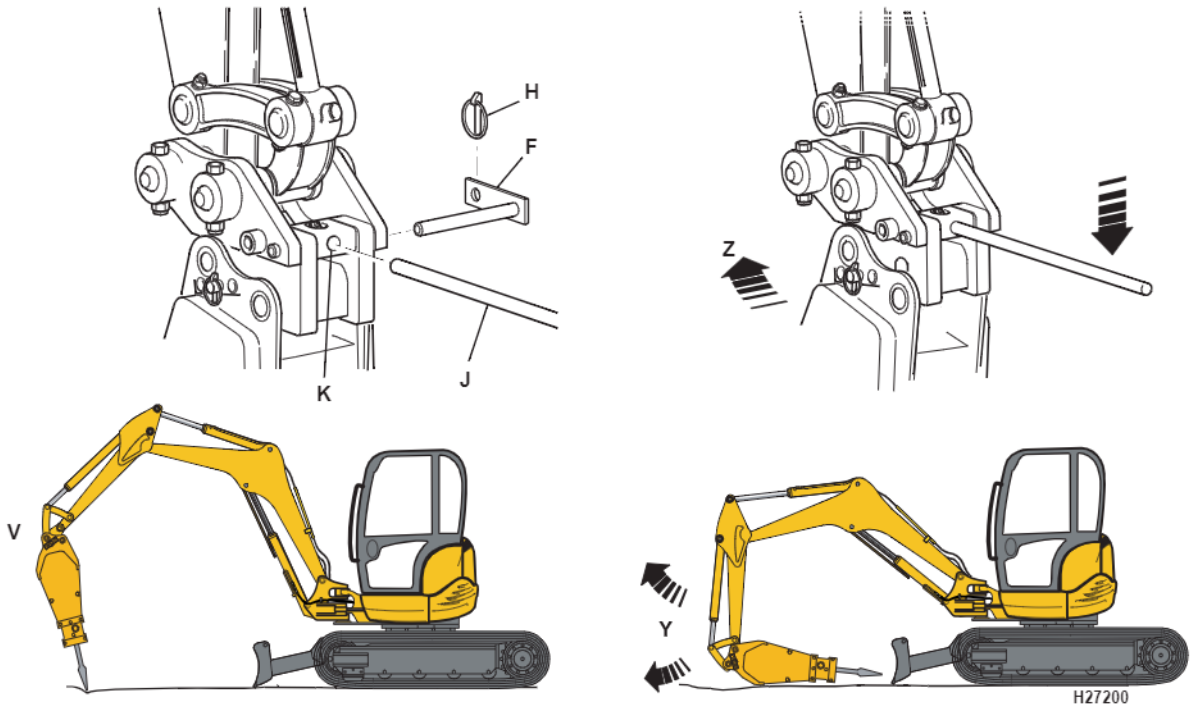
WARNING

Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

INT-3-1-10/1

USING THE ATTACHMENTS AND SITE SAFETY - continued



USING THE ATTACHMENTS AND SITE SAFETY - continued

Removing a Quickhitch Rockbreaker

Note: *Deposit Quickhitch attachments on firm level ground whenever possible. This will make later refitting easy and safe.*

1 Park the machine on firm level ground.

CAUTION

The rockbreaker must be positioned correctly before attempting to release it from the quickhitch. if incorrectly positioned, the rockbreaker could swing or fall suddenly from the machine when releasing the quickhitch latch hook.

2 Position the rockbreaker just clear of the ground and at an angle such that the rockbreaker does not detatch from the front pivot pin when the Quickhitch is unlatched. Typically shown at **V**.

WARNING

Hydraulic Fluid
Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

INT-3-1-10/1

3 Stop the engine.

4 Operate the auxiliary attachment control pedal, this will release any hydraulic pressure trapped in the system.

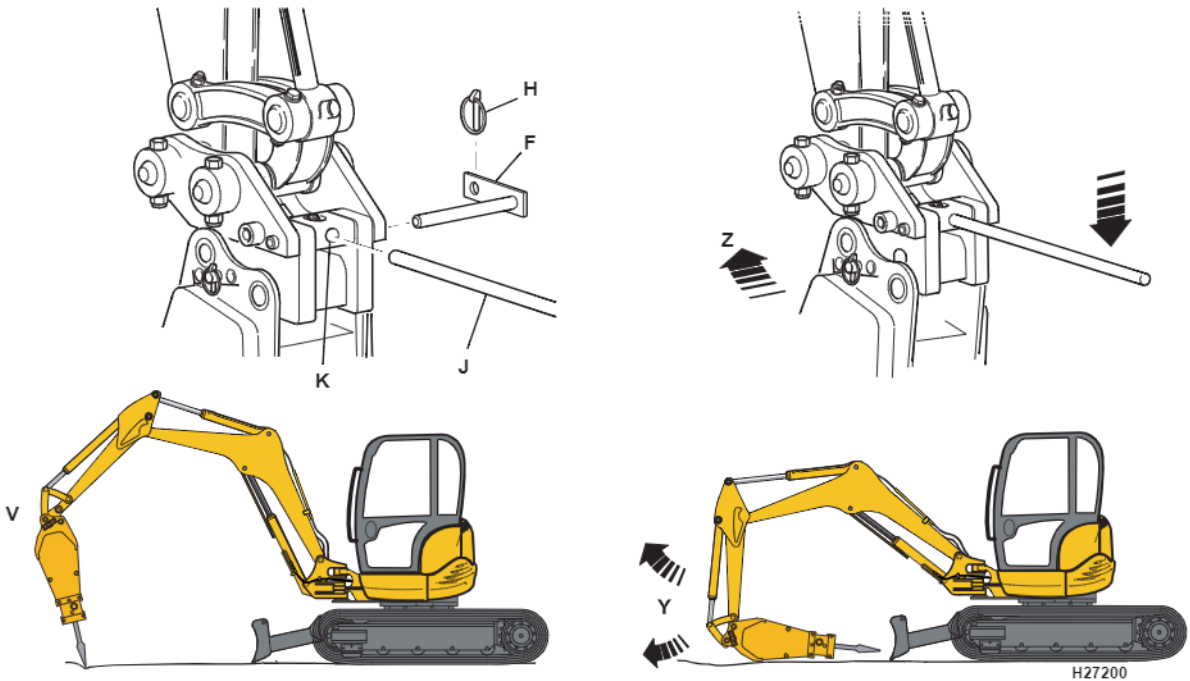
5 Disconnect the hydraulic hoses.

WARNING

The attachment will roll forward when released. Stand clear and to one side when releasing the attachment.

2-4-4-1

USING THE ATTACHMENTS AND SITE SAFETY - continued



USING THE ATTACHMENTS AND SITE SAFETY - continued

Removing a Quickhitch Rockbreaker - continued

6 Remove lynch pin **H**, and locking pin **F**.

7 Insert the tommy bar **J** into the hole **K** of the latch hook.

8 Apply a downward pressure on the bar to release the rockbreakers' rear pivot pin from the latch hook, allowing the attachment to swing forward as shown at **Z**. Remove the tommy bar from the Quickhitch.

9 Refit the locking pin **F** and lynch pin **H**. Failure to refit the pin will result in the rockbreaker re-latching as it is lowered to the ground. Make sure that the hydraulic hoses do not become trapped under the attachment.

10 Start the engine and carefully lower the attachment to the ground as shown at **Y**.

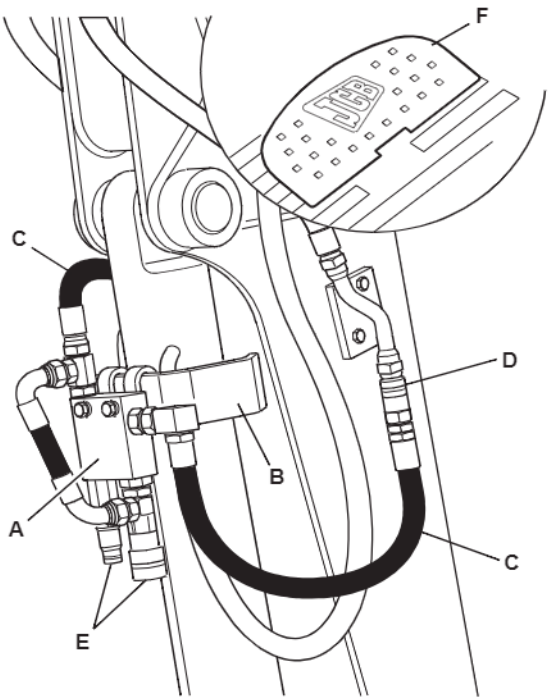
11 Slowly roll the Quickhitch back and simultaneously raise the dipper arm to release the rockbreakers' front pivot pin, as shown at **Y**.

12 Remember to remove the lynch pin **H** and locking pin **F** before fitting another attachment.

Installing a Quickhitch Rockbreaker

Procedure is as installing a bucket.

USING THE ATTACHMENTS AND SITE SAFETY - continued



USING THE ATTACHMENTS AND SITE SAFETY - continued

Using Hand Held Tools

Hand held tools operate from the machine's auxiliary circuit via a valve **A**.

WARNING

Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

INT-3-1-10/1

1 Stop the Engine.

2 Operate the auxiliary attachment control pedal, this will release any hydraulic pressure trapped in the system.

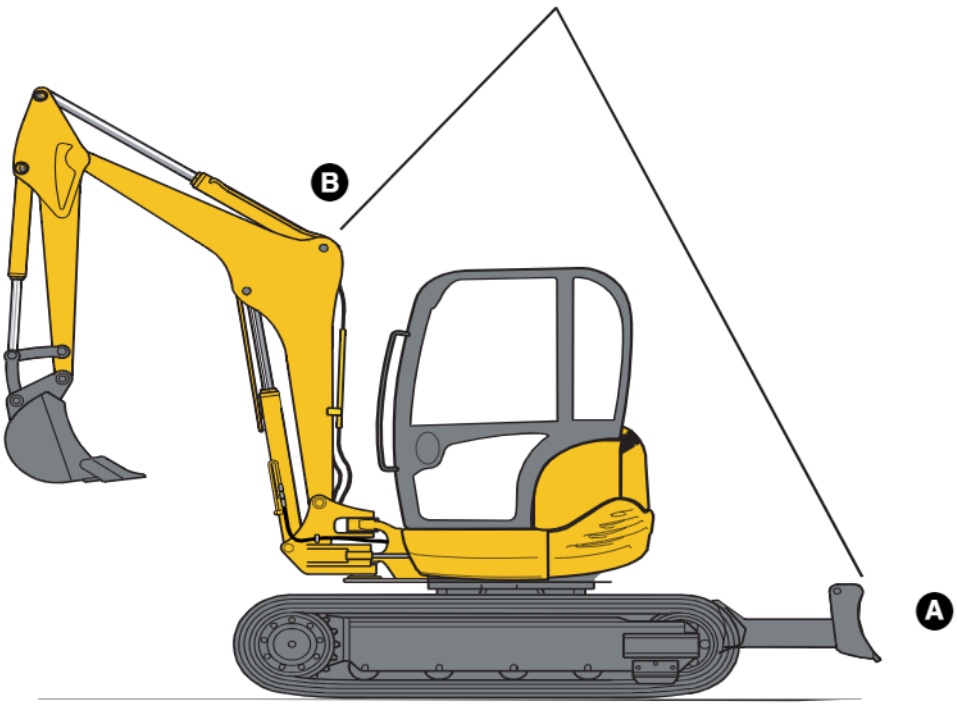
3 Attach the valve **A** to the bucket ram protection plate **B**.

4 Connect the hydraulic hoses **C** to the auxiliary connectors **D**, making sure they are clean.

5 Connect the hand held attachment to the connectors **E**, making sure they are clean.

6 Lock the auxiliary pedal **F** in the operating position.

MOVING A DISABLED MACHINE



MOVING A DISABLED MACHINE - continued

CAUTION

Do not tow a disabled machine. Permanent damage to the track motors will occur if the machine is towed.
HOP68

If the machine becomes disabled, it must not be towed or otherwise moved on its tracks.The machine should be made safe, lifted onto a transporter and moved to a location where maintenance can be carried out.

Lifting points have been provided on the machine as follows:

1 On each end of the dozer blade at points **A**.

2 On the boom at point **B.**

The correct method for 3-point lifting is shown in the illustration opposite.

When the machine is totally disabled, the boom should be set to the fully raised position and lifted using the 3-point lifting method.

TRANSPORTING THE MACHINE

Before loading the machine on to its trailer (see *Transporting the Machine*), remove all loose dirt that may otherwise come off and obstruct the highway and damage other vehicles.

Note: *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.*

Make sure that the transporting vehicle is suitable. See section D for the dimensions and weight of your machine. There is a travel height label fitted to the cab.

Try to make sure that the truck driver knows the clearance height before he drives away. See section D for machine height figures.

Note: *The transport position height does not include the truck/trailer height, add the two figures together for the clearance height.*

CAUTION

Make sure that the two speed tracking selector is set to low speed before loading or unloading the machine.

TRANSPORTING THE MACHINE - continued

Preparing the Trailer

WARNING

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. HOP69

1 Remove any dirt or debris from the trailer.

2 Check the operation of the parking brake.

3 Check the trailer bodywork for signs of damage.

4 Check that the tyre pressures are correct (consult the Manufacturer's handbook).

5 Check that the lights are working and are the correct voltage for the towing vehicle (consult the Manufacturer's handbook).

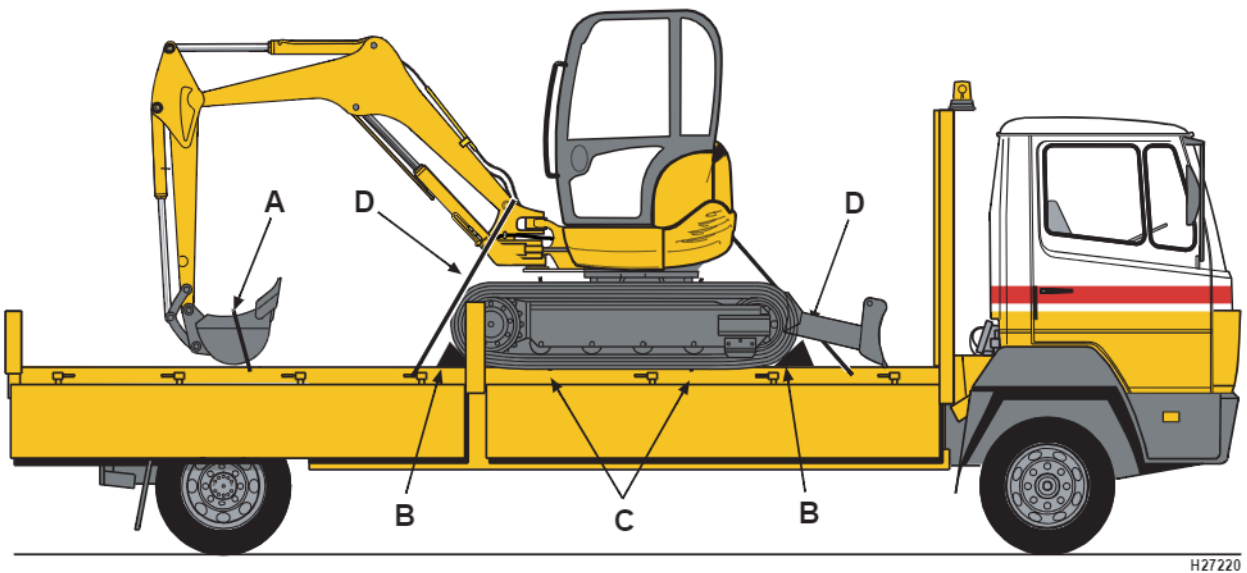
6 Check that the breakaway cable is serviceable.

WARNING

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachment or parts that may move during transit must be adequately secured.
5-2-5-3

TRANSPORTING THE MACHINE - continued

Securing the Machine



TRANSPORTING THE MACHINE - continued

Securing the Machine - continued

WARNING

The machine must be securely tied down to the trailer 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 Engage the slew lock. Ensure by operating the slew control that the slew lock is engaged.

2 Close the bucket. Position the dipper vertically and lower the boom until the bucket rests on a wooden block on the trailer bed.

3 Position a wire rope **A** of suitable breaking strain over the bucket and secure to the trailer shackles.

4 Place skids **B** under each track at front and rear to prevent movement of the machine in the fore-and-aft direction.

5 Position a wire rope **C** of suitable breaking strain around each track frame at front and rear and secure to the trailer shackles to prevent lateral movement of the machine.

6 Attach wire ropes **D** of suitable breaking strain to the lifting points on the superstructure and secure to the trailer shackles to prevent the superstructure from swinging.

PREPARATION FOR STORAGE

The operations to place a machine into storage (-15 °C [5 °F] to 44 °C [111 °F]) are given below.

1 Park the machine safely with the bucket and dipper rams retracted and the dig end outstretched. Lower the boom until the bucket rests on the ground. Lower the dozer to the ground.

2 Switch off the engine. Operate controls to release pressure from the rams.

3 Disconnect the battery to prevent discharge.

4 Ensure that the fuel tank is filled to a maximum, leaving no air space.

5 Ensure that the hydraulic tank is filled to maximum on the sight gauge.

6 Spray exposed ram rods with Waxoyl.

7 Slacken off rubber tracks until no visible spring tension exists.

PREPARATION AFTER STORAGE

The operations to remove a machine from storage (-15 °C [5 °F] to 44 °C [111 °F]) and prepare it for use are given below.

1 Lower the fuel level to ensure that sufficient air space exists in the tank.

2 Check all oil and water levels, adjust contents to correct levels as necessary.

3 Ensure that the battery is fully charged.

4 Reconnect the battery.

5 Remove the electrical supply from the fuel injection pump solenoid.

6 Crank the engine for 20 seconds or until the oil pressure warning light goes out.

7 Reconnect the electrical supply to the fuel injection pump solenoid.

8 Start the engine. If the engine fails to start after several attempts, bleed the fuel system.

9 Adjust track tensions.

10 Grease all lubrication points.

SERVICE CONTRACTS

To make sure your machine keeps working to maximum efficiency, it is essential that it is properly maintained in accordance with the Service Schedules included in this handbook.

We strongly advise you to take advantage of a regular service contract with your JCB dealer. Consult your dealer for full details.

LUBRICANTS - HEALTH AND SAFETY

It is most important that you read and understand this information and the publications referred to.

Hygiene

JCB Lubricants are not a health risk when used properly for their intended purposes. However, excessive or prolonged skin contact may cause irritation.

Whenever you are handling oil products you should maintain good standards of care and personal hygiene. For details of these precautions, read the relevant publications issued by your Local Authority.

Storage

Always keep lubricants out of the reach of children.

Never store lubricants in open or unlabelled containers.

Waste Disposal

All waste products should be disposed of in accordance with all the relevant regulations.
The collection and disposal of used engine oil should be in accordance with any local regulations. NEVER pour used engine oil into sewers, drains or on the ground.

Handling - Used Oil

Used engine oil contains harmful contaminants. Always observe the following precautions.

1 Avoid excessive skin contact with used engine oils.

2 Apply barrier cream before handling oils.

3 Note the following when removing oil from hands.

- Wash thoroughly with soap and water using a nail brush.
- Use special hand cleaners to move stubborn stains.
- NEVER use petrol, diesel fuel or paraffin for washing.
- Avoid skin contact with oil soaked clothing.
- Don't keep oily rags in pockets.
- Wash dirty clothing before reuse.
- Throw away oil soaked shoes.

LUBRICANTS - HEALTH AND SAFETY - continued

First Aid - Oil

Eyes

In the case of eye contact, flush with water for 15 minutes. If irritation persists, get medical attention.

Swallowing

If oil is swallowed, do not induce vomiting. Get medical advice.

Spillage

Absorb with sand or approved absorbent granules. Scrape up and remove to a chemical disposal area.

Fires

Extinguish with carbon dioxide, dry chemical or foam extinguishers. DO NOT USE WATER. Breathing apparatus should be used.

MAINTENANCE SAFETY CHECK LIST

WARNING

Repairs

Do not try to do repairs or any other maintenance work you do not understand. Get a Service Manual from your JCB Dealer, or get the work done by the JCB Dealer's specialist engineer.

WARNING

Modifications and Welding

Non approved modifications can cause injury and damage. Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Contact your JCB Dealer before attempting any modifications.

WARNING

Metal Splinters

You can be injured by flying metal splinters. Use a soft faced hammer or drift when removing and fitting metal pins. Always wear safety glasses.

WARNING

Electrical Circuits

Understand the electrical circuit before connecting or disconnecting an electrical component. A wrong connection can cause damage and/or injury.

WARNING

Batteries

A frozen battery can explode if it is used or charged. Do not use a machine with a frozen battery.

Batteries give off explosive gases. Keep flames or sparks away. Do not smoke. Make sure there is good ventilation when batteries are being recharged.

WARNING

Oil

Oil is toxic If you swallow any oil, do not induce vomiting, seek medical advice. Used engine oil contains harmful contaminants which can cause skin cancer. Do not handle used engine oil more than necessary. Always use barrier cream or wear gloves to prevent skin contact. Wash skin contaminated with oil thoroughly in warm soapy water. Do not use petrol, diesel fuel or paraffin to clean your skin.

INT-3-2-3

WARNING

Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not place your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates the skin, get medical help immediately.

INT-3-1-10/1

MAINTENANCE SAFETY CHECK LIST - continued

WARNING

Petrol

Do not use petrol in this machine. Do not mix petrol with the diesel fuel; the petrol may rise to the top and form flammable vapours.

WARNING

Diesel Fuel

Diesel fuel is flammable; keep naked flames away from the machine. Do not smoke while refuelling. Do not leave the engine running while refuelling.

WARNING

Rams

The machine's efficiency will be affected if the rams are not kept free of solidified dirt. When parking close all rams as far as possible to prevent weather corrosion.

WARNING

Hot Coolant

The cooling system is pressurised when the engine is hot. Hot coolant can spray out when you remove the filler cap. Let the system cool before removing the filler cap. To remove the cap; turn it to the first notch and let the steam pressure escape, then remove the cap.

INT-3-2-9/1

WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the engine and operate the controls to release pressure trapped in the hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11/1

CAUTION

'O' rings, Seals and Gaskets

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakages and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

INT-3-2-12

Service Schedules

A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in these Service Schedules are done to keep the machine working at its optimum efficiency.

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. Do not use a machine which is due for a service. Make sure any defects found during regular maintenance checks are rectified immediately.

WARNING

Maintenance must be done by suitably qualified personnel. Before attempting any maintenance work, make sure that the machine is safe. Park on a level site and lower the bucket and dozer to the ground.

SERVICE SCHEDULES - continued

Every 50 operating hours (or weekly) whichever occurs first

Do the daily jobs plus:

Clean

1 Drain and clean fuel filter/sedimenter
2 Radiator matrix and Oil Cooler matrix

Check and Adjust where necessary (engine stopped)

3 Fan belt adjustment

First 100 hours only

Do the jobs listed in 100 hours (below) plus:

1 Check and adjust fan belt

Every 100 operating hours (or 2 weeks) whichever occurs first

Do the daily jobs through to 50 hours plus:

Clean

1 Battery terminals

Check and adjust where necessary (engine stopped)

2 Hose and pipework for security and damage
3 Condition of ram piston rods
4 All grease seals
5 Track plate condition/rubber condition
6 Engine mounting bolts
7 Air cleaner hose security
8 Wiring for damage
9* Track tension

Note: *Jobs which should only be done by a specialist are indicated by**

SERVICE SCHEDULES - continued

First 250 operating hours

Do the jobs listed in 250 hours (below) plus:

1 Change track gearbox oil

Every 250 operating hours (or monthly) whichever occurs first

Do the daily jobs through to 100 hours plus:

Change

1 Fuel in-line pre filter

Grease

2 Slew ring grease nipple

Every 500 operating hours (or 6 months) whichever occurs first

Do the daily jobs through to 250 hours plus:

Clean

1 Fuel lift pump
2* Fuel injectors (and test)
3 Engine oil and filter cannister

Change

4 Fuel filter element
5 Hydraulic fluid return filter element
6 Air cleaner element (in very dusty conditions only)
7 Engine oil and engine oil filter

Check and Adjust where necessary (engine stopped)

8 Exhaust system security
9* Tighten cylinder head bolts
10* Adjust valve clearances
11 Engine mounting bolts
12 Track gearbox oil levels

Check and Adjust where necessary (engine running)

13* Main relief valve pressures
14* Auxiliary relief valve pressures
15* Servo relief valve pressures
16* Cross line relief valve pressure
17* Engine idle speed

Note: *Jobs which should only be done by a specialist are indicated by**

SERVICE SCHEDULES - continued

Every 1000 operating hours (or yearly) whichever occurs first

Do the daily jobs through to 500 hours plus:

Change

1 Air filter element (outer)
2* Idler wheel and track rollers oil and seals
3 Track gearbox oil

Check

4 Cab mountings (for security)
5 Check security of all bolts retaining major assemblies, i.e. gearboxes (track and swing), slew ring, engine mountings, rotary joints etc.
6* Check and clean filter adaptors fitted in pressure maintenance valve.
7 Check and clean Air filter dust valve.

Grease

8 Slew ring pinion and slew ring gear teeth

Every 2000 operating hours (or 2 years) whichever occurs first

Do the daily jobs through to 1000 hours plus:

Change

1 Air filter element (inner)
2 Track gearbox oil
3* Hydraulic fluid and clean suction strainer
4 Engine coolant

Check (engine stopped)

5 Battery electrolyte level (low maintenance)
6* Valve clearance and lubrication
7* Starter motor and alternator brush gear
8* Inspect and renew the pump drive coupling

***Note**: Jobs which should only be done by a specialist are indicated by**

CHECKING THE MACHINE

Checking for Damage

WARNING

Do not open the engine cover while the engine is running.

WARNING

A hot exhaust pipe will burn you. Take care when you remove the engine panels.

Inspect bodywork for damage. Note damaged paintwork for future repair.

Make sure all pivot pins are correctly in place and secured by their locking devices.

Check for broken or cracked window glass. Replace damaged items.

Check all bucket teeth for damage and security.

Check all lamp lenses for damage.

Check that all safety decals are in place and undamaged. Fit new decals where necessary. See *Safety Decals* (Introduction section).

Cleaning the Machine

Clean the machine using water and/or steam. If steam is used, the machine must be completely greased afterwards. See *Greasing* on the following pages.

Pay particular attention to the cab windows. Make sure that the radiator grill is not blocked.

Do not allow mud to build up on the tracks and running gear. See *Tracks and Running Gear.*

CHECKING THE MACHINE - continued

Checking the Seat Belt Condition and Security

WARNING

When a seat belt is fitted to your machine replace it with a new one if it is damaged, if the fabric is worn or if the machine has been in an accident. Fit a new seat belt every three years.

1 Inspect the seat belt for signs of fraying or stretching.

2 Check that the stitching is not loose or damaged.

3 Check that the recoil assembly and clip are undamaged and work correctly.

4 Check that the seat belt mounting bolts are secure, undamaged, and correctly fitted.

Checking the Cab/Canopy Frame

WARNING

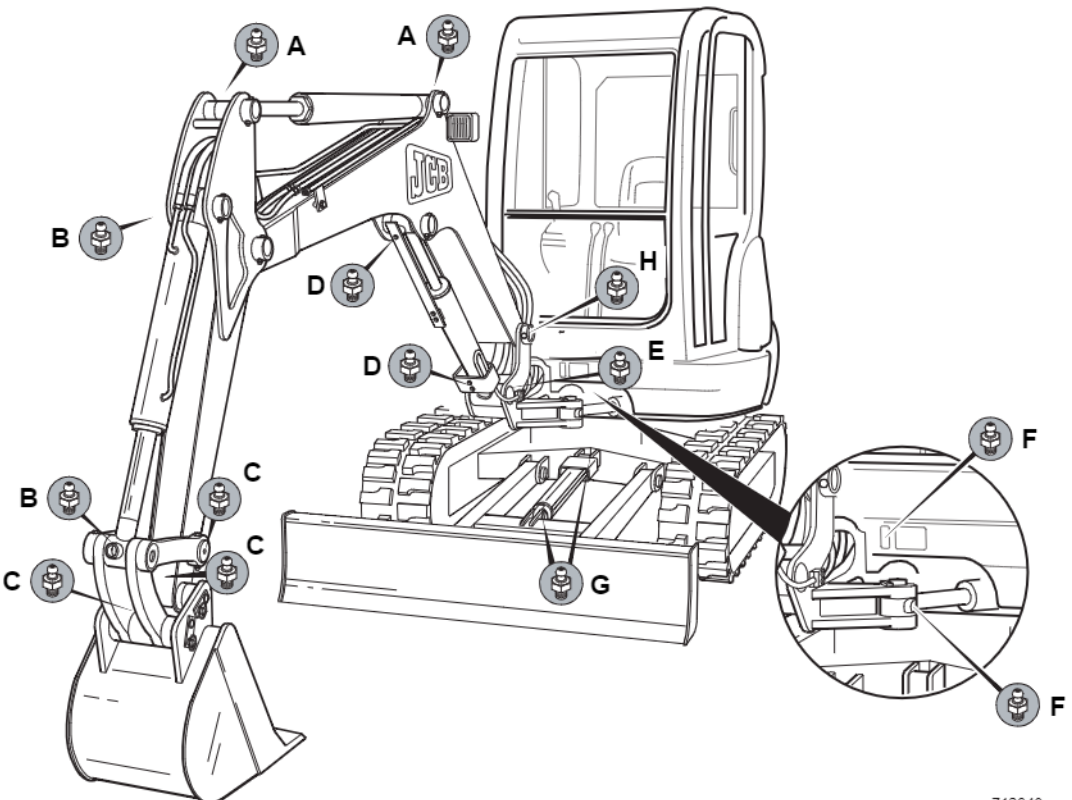
Modified and wrongly repaired cab frames are dangerous. Do not modify the cab fame. Do not attempt to repair the cab frame. If the cab frame has been in an accident, do not use the machine until the structure has been inspected and repaired. This must be done by a qualified person. For assistance, contact your JCB dealer. Failure to take these precautions could result in death or injury to the operator.

1 Check the cab/canopy frame for damage.

2 Check that all the mounting bolts are installed and undamaged.

3 Check that the bolts are tight.

GREASING - DAILY



GREASING - DAILY

You must grease machine regularly to keep it working efficiently. Regular greasing will also lengthen the machine's working life.

Greasing should be done with a grease gun. Normally two strokes of the gun should be enough. Stop greasing when fresh grease appears at the joint.

WARNING

You will be working close in to the machine for these jobs. Lower the attachments to the ground if possible. Remove the starter key.

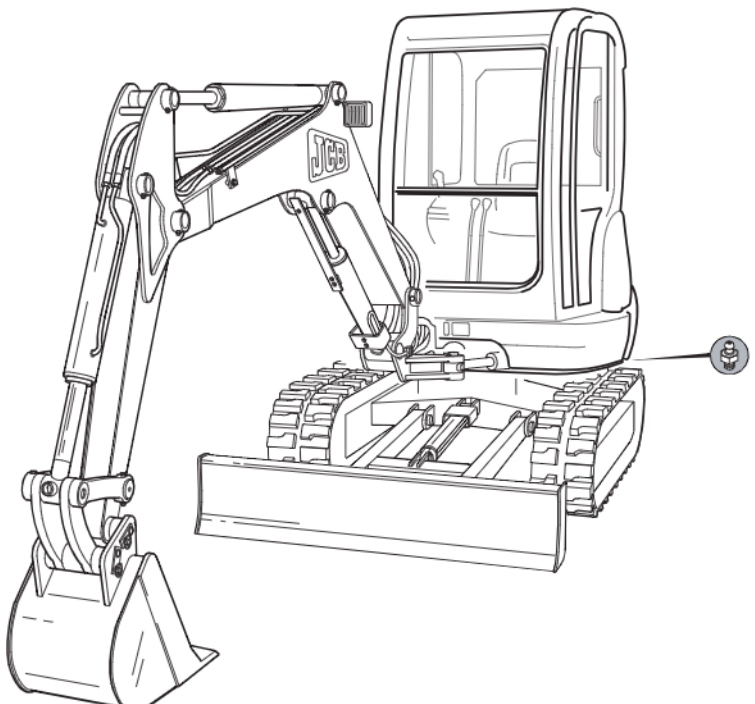
For the types of grease to use at each point see the *Lubricants and Capacities* chart at the end of the Maintenance section. Do not mix different types of grease, keep them separate.

Note: *Some optional attachments may need greasing more often. See* ***Optional Attachments****.*

Pivot Pins

A Dipper ram pivot pin,
B Bucket ram pivot pin,
C Bucket pivot pin,
D Boom ram pivot pin,
E Kingpost pivot pin,
F Slew ram pivot pin
G Dozer Ram pivot pin,
H Dipper pivot pin

GREASING - continued



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GREASING (every 250 hours)

Slew Ring Bearings

Ensure the slew ring is kept full of grease.
Locate the grease point on the slew ring side.

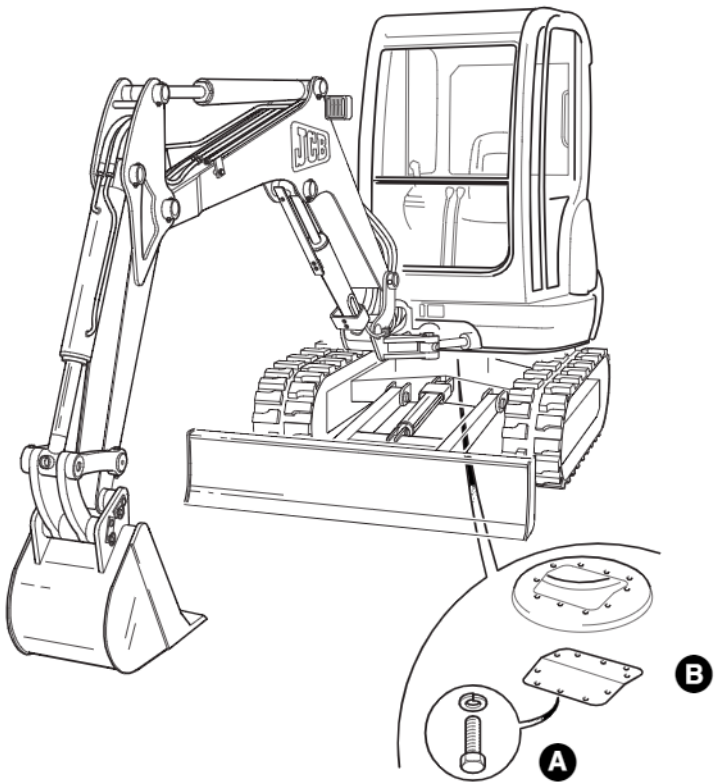
To ensure full distribution of the grease, use the following procedure.

1. Grease in, using 4 strokes of the grease gun. Rotate 180^0.

2. Grease in, using 4 strokes of the grease gun. Rotate 180^0.

3. Grease in using 4 strokes of the grease gun.

GREASING (every 1000 hours)



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GREASING (every 1000 hours)

Slew Ring Gear Teeth

WARNING

JCB Slew Pinion Grease is harmful as it contains bitumen compounds 2811. Excessive contact may lead to dermatitis or skin cancer. Always use a barrier cream or wear gloves; wash contaminated skin thoroughly with soap and water. In the event of eye contact, immediately wash with plenty of water and seek medical advice.

WARNING

Soft Ground

A machine may sink into soft ground. Never work under a machine on soft ground.

WARNING

Jacking

A machine can roll off jacks and crush you. Do not work under a machine supported only by jacks.

1 Raise the machine and support the undercarriage.

2 Stop the engine and remove the starter key.

3 Remove bolts **A** and plate **B** in the underside of the undercarriage.

4 Apply the grease to the pinion using the applicator (see *Fluids, Lubricants and Capacities*).

5 Start the engine and rotate the mainframe fully twice.

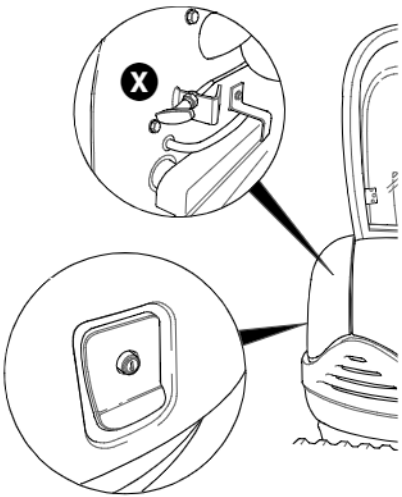
6 Stop the engine and remove the key.

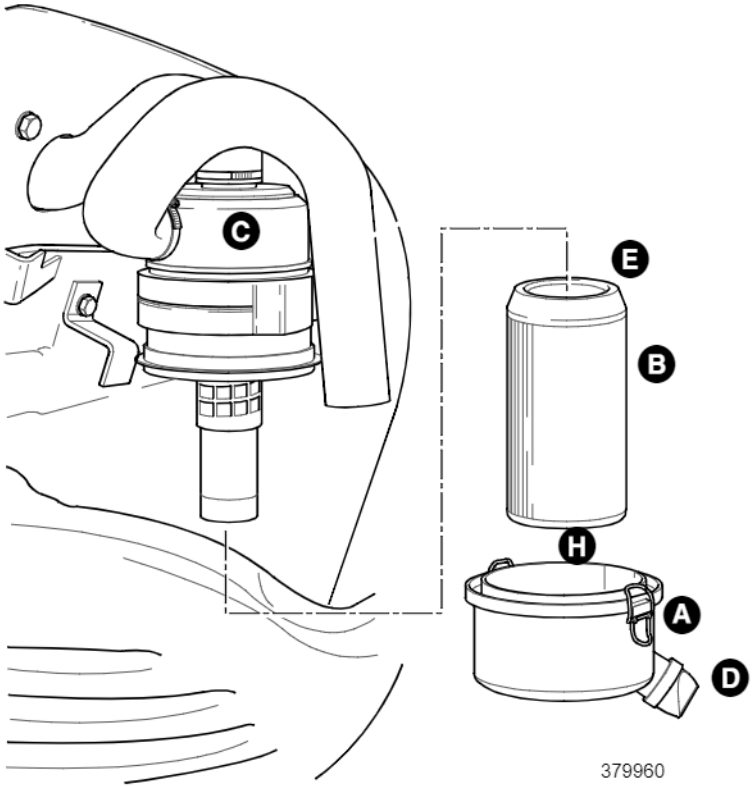
7 Repeat step **4** as necessary.

8 Refit the plate **B** using bolts **A.**

9 Lower the machine to the ground.

ENGINE AIR FILTER





ENGINE AIR FILTER - continued

Changing the Outer Element

1 Stop the engine and remove starter key.

2 Raise the engine cover.

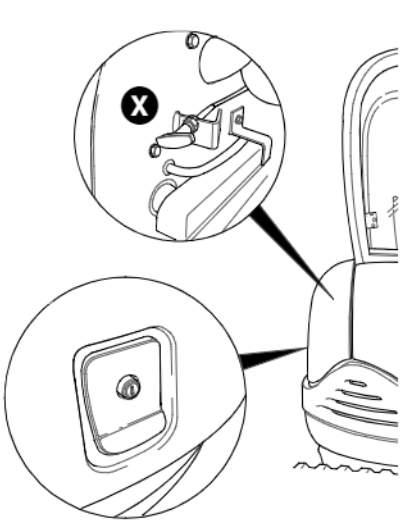
3 Release catch **X** and raise the hydraulic bay cover.

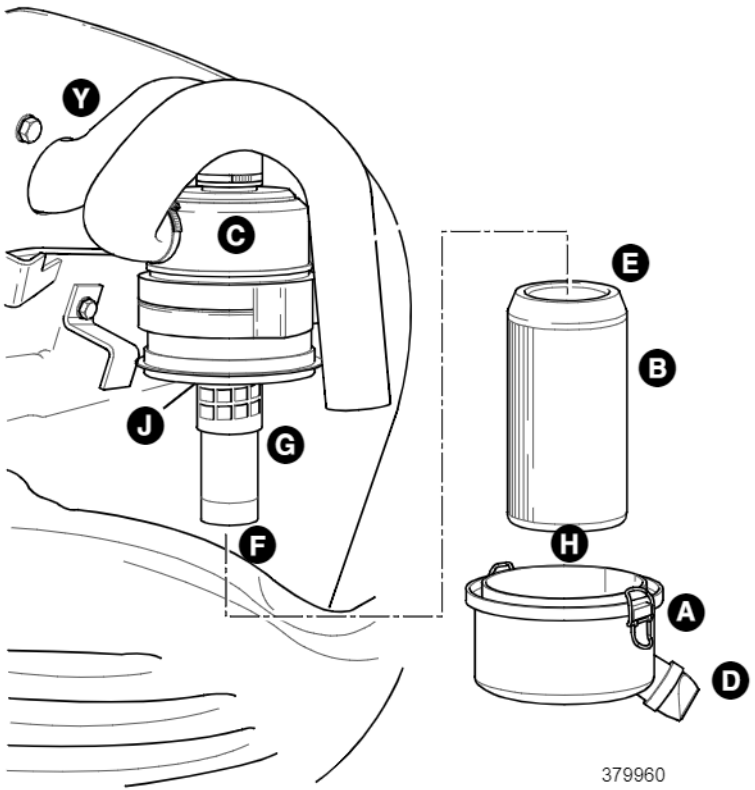
4 Undo the two retaining clips holding the cover and remove the element **B**. (Unscrew the wingnut **H**.)

5 Clean the inside of canister **C** and dust valve **D**.

6 Prior to fitting new element, smear the seal **E** on the end of the element with grease. Temporarily insert the filter element into the canister ensuring its correct location. Withdraw the element and check that there is a continuous grease witness mark around the base of the canister. This shows that the canister has not been distorted which would allow unfiltered air to bypass the element. Refit the element and secure the filter cap with clips **A.** Check all air hoses for condition and security.

ENGINE AIR FILTER - continued





ENGINE AIR FILTER - continued

Changing the Inner Element

1 Stop the engine and remove starter key.

2 Raise the engine cover.

3 Release catch **X** and raise the hydraulic bay cover.

4 To prevent dust getting into the engine, remove the induction hose **Y**. Cover the hose to prevent rain and dirt getting into the engine.

5 Undo the two retaining clips holding the cover and remove the element **B**. (Unscrew the wingnut **H**.)

6 Unscrew nut **F** and remove inner element **G.**

7 Clean inside of canister **C** and dust valve **D.**

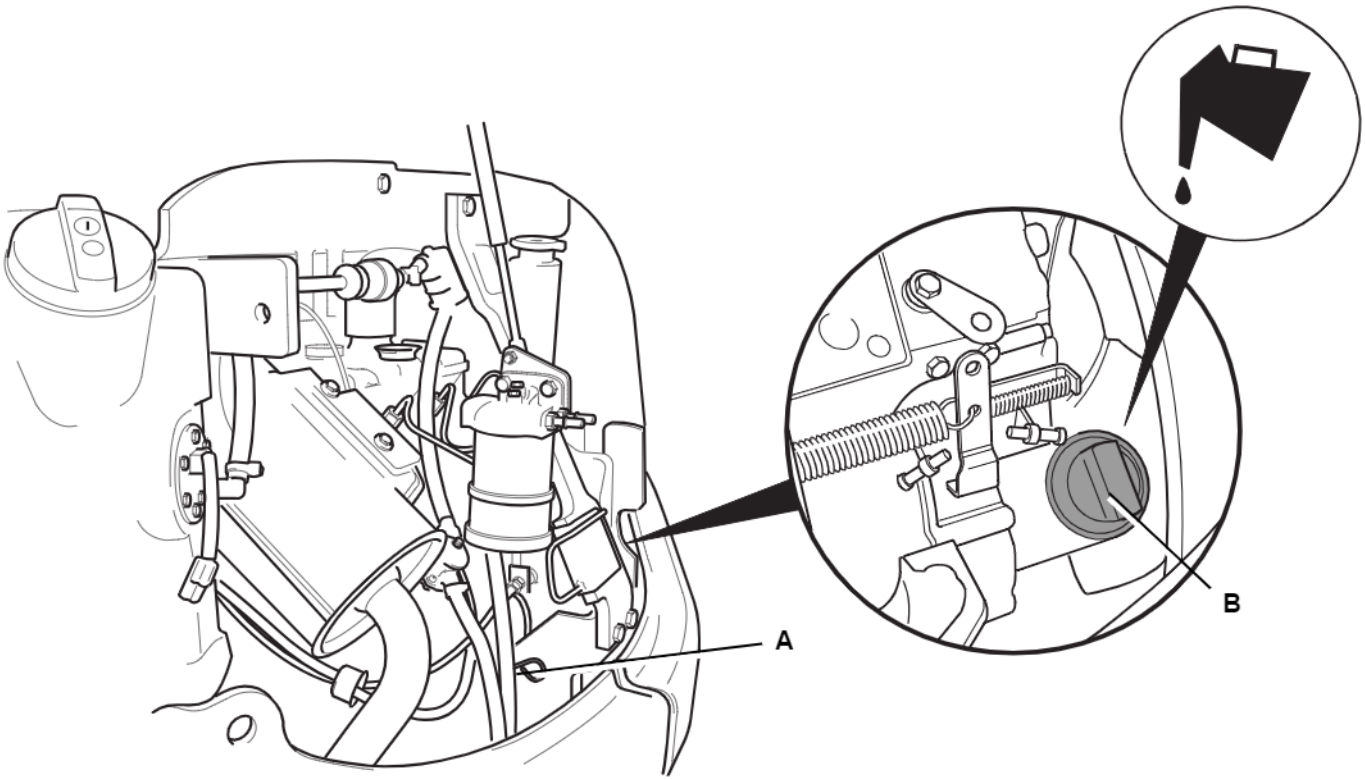
8 Smear the seal **J** of new inner element and carefully insert into canister making sure that it seats correctly. Withdraw element and check for continuous grease witness mark on the canister base. Refit element and secure with nut **F.**

9 Follow the same practice when fitting outer element this time smearing seal **E** with grease, inserting element correctly, withdrawing and checking for continuous grease witness mark. Refit element and secure with wingnut **H**.

10 Remove cover from induction hose **Y** and refit. Check security and condition of all air hoses.

Note: *In a dusty working environment, the outer element may have to be changed more frequently than the Service Schedule recommendation. A new inner element must be fitted at latest every third time the outer element is changed. As a reminder, mark the inner element with a felt tip pen each time the outer element is changed.*

ENGINE OIL



ENGINE OIL - continued

Checking the Oil Level

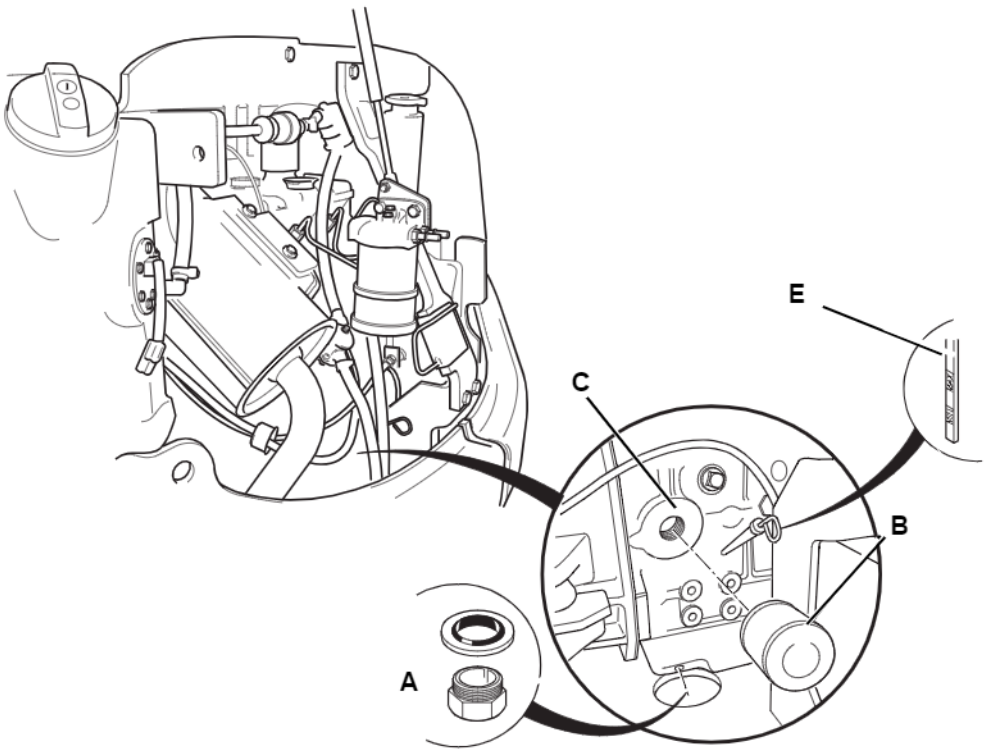
1 Park the machine on level ground. Lower the excavator and dozer to the ground.

2 Stop the engine and remove starter key.

3 Raise the engine cover. Allow time for the oil to drain back into the engine sump before taking a reading. If insufficient time is given a false low reading may be recorded which will result in overfilling the engine.

4 Withdraw dipstick **A** and wipe clean, re-insert fully into tube and withdraw to check level. The correct level will show the oil at the top of the hatched area of the dipstick **A**. If necessary add oil slowly through the filler **B**. Replace filler cap securely. Use only the recommended oil, see the Lubricants and Capacities chart at the end of this section.

ENGINE OIL - continued



ENGINE OIL - continued

Changing the Oil and Filter

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

Keep your face away from the drain hole when removing the drain plug.

1 Place a container beneath the engine (to catch the oil), See the **Lubricants and Capacities** chart at the end of the Maintenance section for capacity. From under the machine, remove the drain plug **A**. Drain the oil, clean and refit the drain plug.

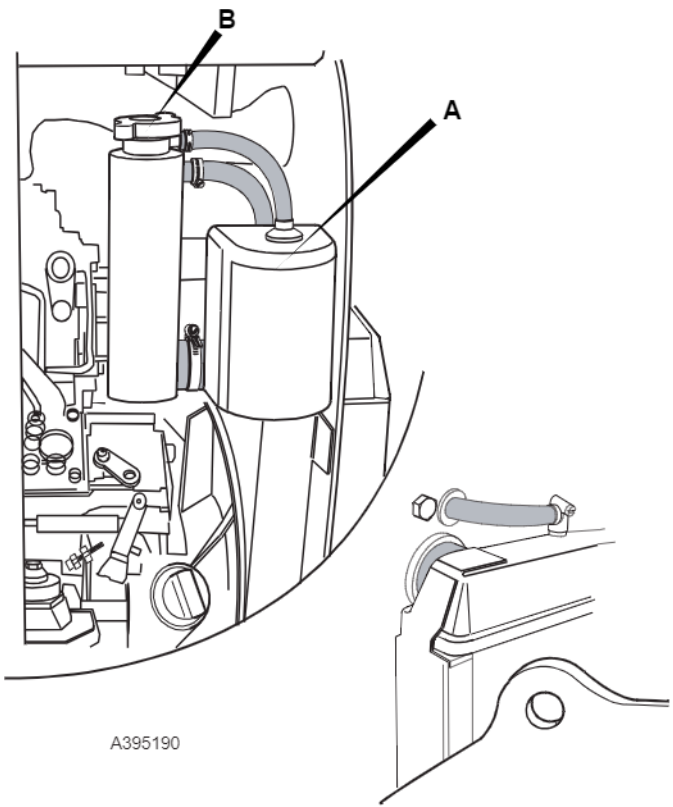
CAUTION

The oil filter canister will contain some oil which could spill out when you remove the canister.

2 Unscrew the filter canister **B**. If necessary use a chain or strap wrench. Clean the filter mounting face **C**. Smear the seal on the new filter canister with oil. Screw in the new canister - hand tight and then one quarter turn.

3 Fill the engine with new oil through the filler. See **Lubricants and Capacities** chart at the end of Maintenance section for capacities and recommended oil grades.
Check the oil level on dipstick **E**.
Wipe off any spilt oil. Check for leaks.
Make sure that the filler cap is correctly refitted.

ENGINE COOLING SYSTEM



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WARNING

The cooling system is pressurised when the coolant is hot. Hot coolant will burn you. Make sure that the engine is cool before checking the coolant level or draining the system.

Checking the Coolant Level

1 Park the machine on level ground, stop the engine and remove the starter key. Raise the engine cover and allow the engine to cool.

2 Observe the coolant fluid in the expansion bottle, the bottle **A** should be half full of coolant.

3. Top up the system, if required by carefully removing the expansion tube filler cap **B**, top up the level to the neck of the expansion tube.

4 Refit the filler cap **B** making sure that it is tight.

Note: *Water in the expansion bottle and not in the radiator indicates expansion bottle tube leaking or a non-sealing radiator pressure cap.*

ENGINE COOLING SYSTEM - continued

Coolant Mixtures

The protection provided by typical antifreeze solutions is shown below as a guide. Refer to the manufacturer's instructions for temperatures relating to the type of antifreeze used. Make sure that a corrosion inhibitor is included

Solution	Starts to Freeze	
%	^{0}C	^{0}F
15	-8	17
25	-12	10
33	-19	-2
50	-36	-33

Note: *In climates where antifreeze is not necessary, a reputable corrosion inhibitor must be used.*

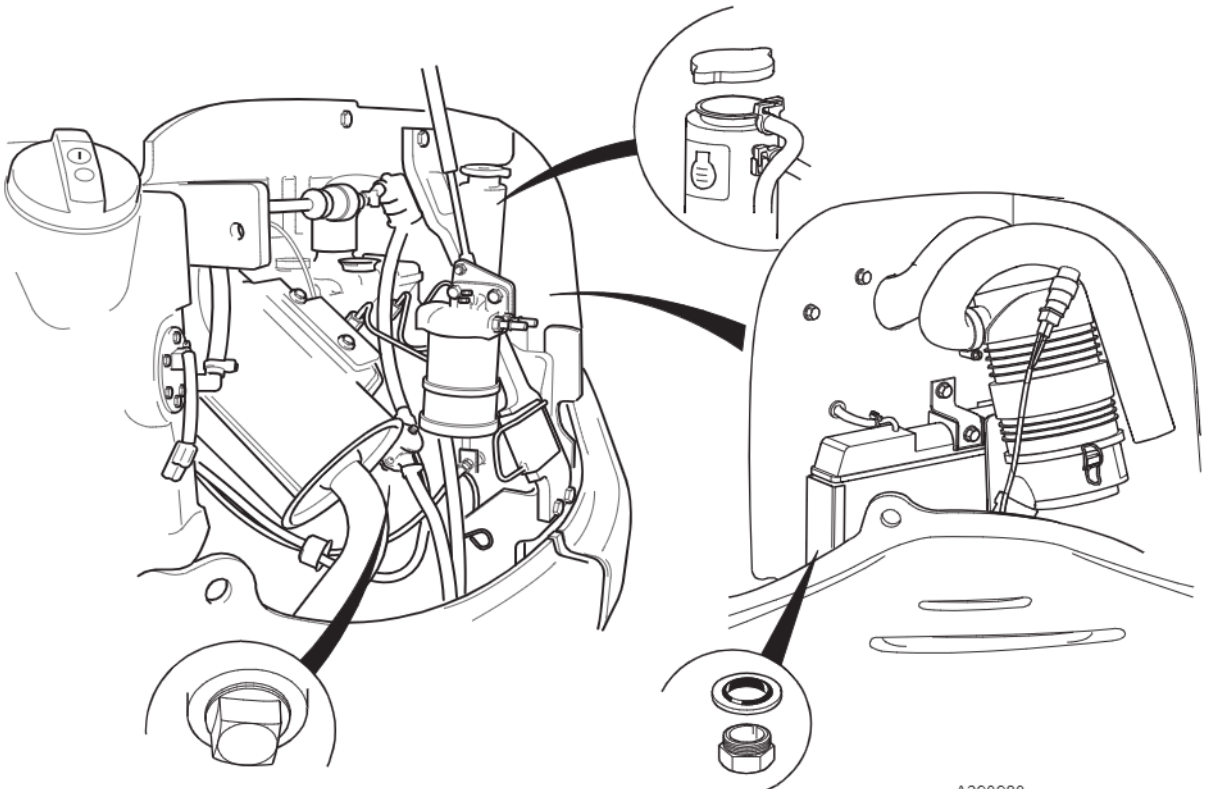
Note: *A 50% antifreeze mixture is recommended even if frost protection is not needed. This gives protection against corrosion and raises the coolants boiling point.*

Note: *Check the quality of the antifreeze mixture every year, before the cold weather starts. Make sure it is changed every two years.*

WARNING

Ensure the antifreeze solution does not exceed 50%, overheating may result.

ENGINE COOLING SYSTEM - continued



ENGINE COOLING SYSTEM - continued

CAUTION

Keep your face away from the cylinder block tap and the radiator drain plug when you drain the system.

Changing the Coolant

1 Do steps 1 and 2 of *Checking the Coolant level*.

2 Undo the speed plug **A** on the cylinder block and let the coolant drain out. Remove the radiator drain plug **B** and let the coolant drain out. Make sure the drain holes are not blocked.

3 Flush the system with clean water if necessary

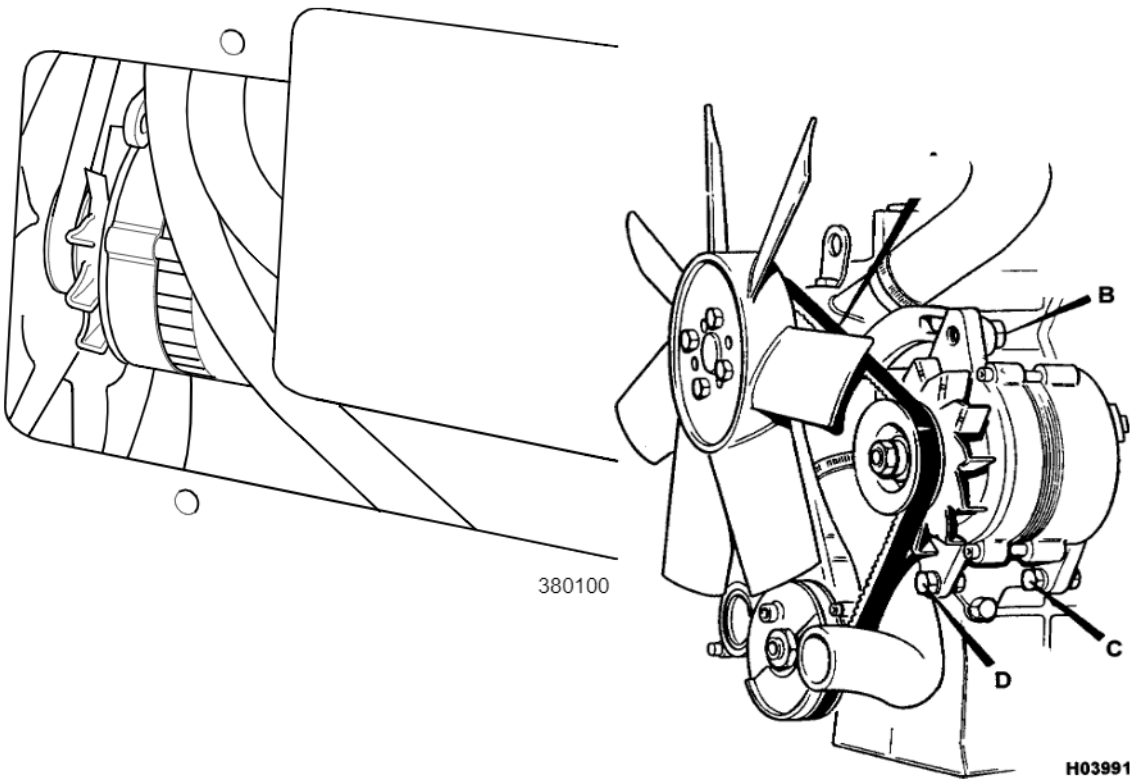
4 Close the speed plug **A.** Make sure the drain plug **B** is clean and refit it. Make sure it is tight.

5 Fill the system. Use the correct mix of clean, soft water and anti-freeze (see *Coolant Mixtures*)

6 Refit the filler cap making sure that it is tight.

7 Run the engine for a while, to raise the coolant to working temperature and pressure. Stop the engine. Check for leaks.

ADJUSTING THE FAN BELT



ADJUSTING THE FAN BELT - continued

WARNING

Make sure that the engine cannot be started. Disconnect the battery before doing this job.

2-3-3-5

1 Remove the bolts securing the seat plate, remove the seat.

2 From inside the cab, remove the engine access plate located at the top of the rear bulk head.

3 Slacken the bolts securing the seat base, and slide the unit toward the front of the cab.

4 Remove the lower engine access plate.

5 Open the engine bay cover and check that there is 5 mm (0.2 in) slack mid way between the fan pulley and the alternator pulley.

6 From inside the cab, If necessary loosen the alternator mounting bolts.

IMPORTANT: Excessive fan belt slack may result in damage to the engine timing cover.

CAUTION

Any leverage required to position the alternator must be applied at the drive end only. Use only a wooden lever.

7 Position the alternator so that there is 5 mm (0.2 in) slack mid way between the fan pulley and the alternator pulley.

8 Tighten the alternator mounting bolts in the order **B**, **C** and **D**.

9 Recheck the fan belt tension.

10 Replace the covers, seat base and seat.

FUEL SYSTEM

WARNING

Do not use petrol in this machine. Do not mix petrol with diesel fuel. In storage tanks the petrol could rise to the top and form flammable vapours.

WARNING

Diesel fuel is flammable: keep naked flames away from the machine. Do not smoke while refuelling the machine or working on the engine. Do not refuel with the engine running. There could be a fire and injury if you do not follow these precautions.

Filling the Tank

At the end of every working day, fill the tank with the correct type of fuel. This will prevent overnight condensation from developing in the fuel. Do not fill the tank completely, leave some space to allow the fuel to expand

We recommend that you lock the fuel cap to prevent theft and tampering.

FUEL SYSTEM - continued

Advice

Use quality diesel fuel in order to obtain the correct power and performance from your engine. Cetane 45 (minimum).

If you have to use non-standard fuels contact your JCB dealer for advice on engine adjustment and oil change periods.

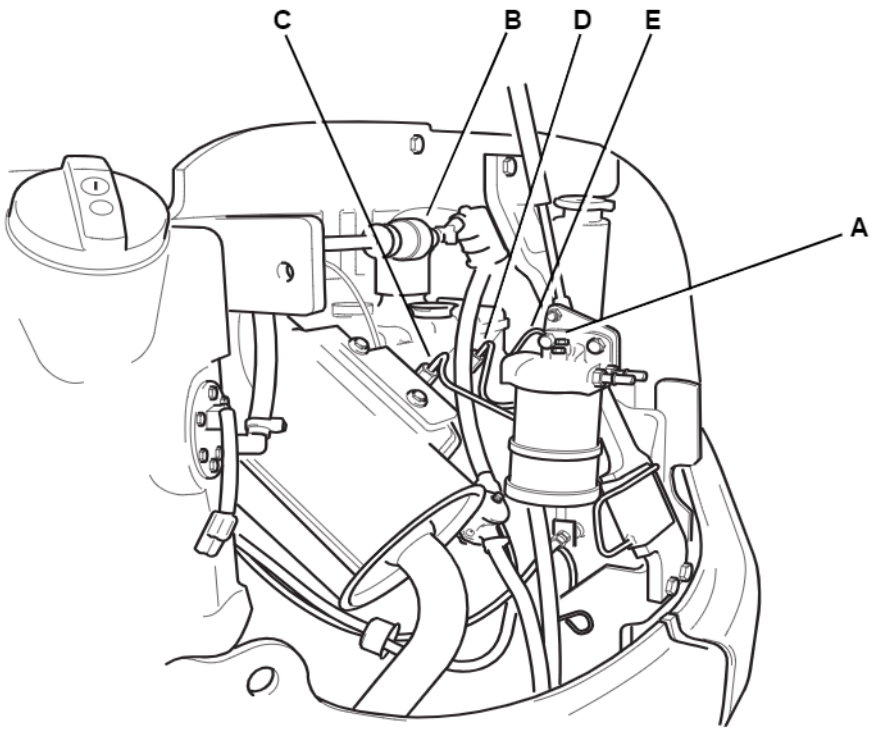
Consult your fuel supplier or JCB dealer about the suitability of any fuel you are unsure of.

Low Temperature Fuels

Special winter fuels may be available for engine operation at temperatures below 0 ^{O}C (32 ^{O}F). These fuels have a lower viscosity. They also limit wax formation in the fuel at low temperatures (wax forming in the fuel can stop the fuel flowing through the filter).

Flow improvers may also be available. These can be added to the fuel to reduce wax formation.

FUEL SYSTEM - continued



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FUEL SYSTEM - continued

Bleeding the Fuel System

WARNING

Air in the fuel system can cause misfiring or failure to start. Air will enter the system if any part of it is disconnected or emptied.

WARNING

To bleed the air from the system, the engine must be turning. When the engine is turning, there are parts rotating in the engine compartment. Before starting this job, make sure you have no loose clothing (cuffs, ties etc.) which could get caught in rotating parts. Keep clear of rotating parts.

1 Raise the engine cover.

2 To bleed air from the filter, slacken bleed screw **A**. Operate fuel priming bulb **B** until air free fuel flows from the union.

3 The fuel injection pump is self bleeding as the engine is cranked.

WARNING

When you turn the engine to bleed the fuel lines, do not operate any of the hydraulic control levers.

4 Loosen the unions at **C**, **D** and **E**. If you are working with an assistant warn him that you are about to turn the engine.

5 Open the throttle a little and turn the starter key to rotate the engine.

6 When air-free fuel flows from all three points, tighten the unions.

FUEL SYSTEM - continued

Draining the Filter/Sedimenter

1 Drain off any water in the filter by opening tap **A**.

Changing the Filter Element

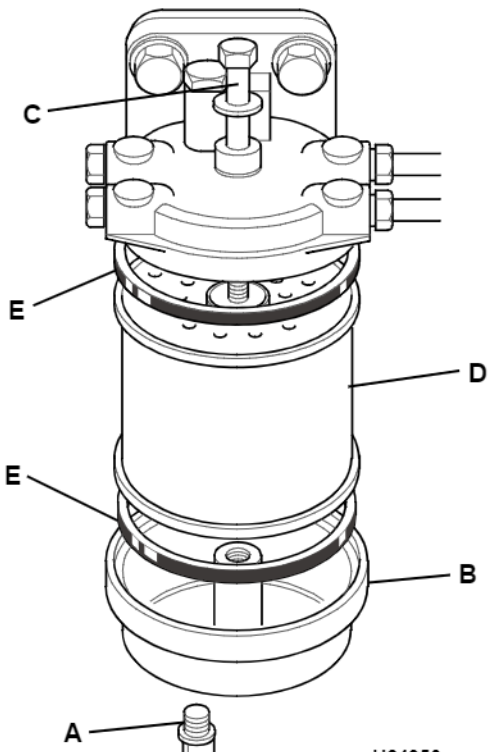
1 Disconnect the battery.

2 Raise the engine cover.

3 Support bowl **B**, unscrew bolt **C**. Remove the bowl and element **D**. Wash the bowl in clean fuel.

4 Install the new element **D** with new seals **E**. Make sure they seat correctly. Tighten bolt **C**. Check for leaks.

5 Bleed the system.



TRACKS AND RUNNING GEAR

Cleaning the Tracks

WARNING

If two people are doing this job make sure that the person operating the controls is a competent operator. The other person could be killed or injured if the wrong lever is moved or a control operated violently.

If you are working with another person, make sure you both know what is to be done. Learn and use recognized signalling procedures. Do not rely on shouting, you may not be heard.

To clean the tracks they must be lifted in turn off the ground and then rotated. When the tracks are turning keep well clear. Make sure you have no loose clothing that could get caught in rotating parts. Keep uninvolved people well away.

1 Park the machine on level ground. Operate the controls to slew the cab around across the tracks. Lower the bucket to the ground.

2 Operate the controls to push the boom down so that the track nearest the bucket is lifted clear of the ground.

WARNING

Rotating the tracks off the ground may cause stones and other debris to be thrown with considerable force. If you are on the outside, keep well clear. Keep other people well clear.

TRACKS AND RUNNING GEAR - continued

3 Operate the controls to rotate the track which is off the ground. Rotate it one way and then the other to shake off the mud. If necessary the person outside may use water from a hose to help loosen sticky material.

4 When the track is clean stop the rotation. Inspect the track, rollers sprockets and idler wheels for damage or oil leaks. Replace any damaged parts. If in doubt consult your JCB Dealer.

5 Operate the controls slowly to lower the track to the ground.

6 Operate the controls to position the bucket on the other side of the machine so that steps 2 to 5 can be repeated for the other track.

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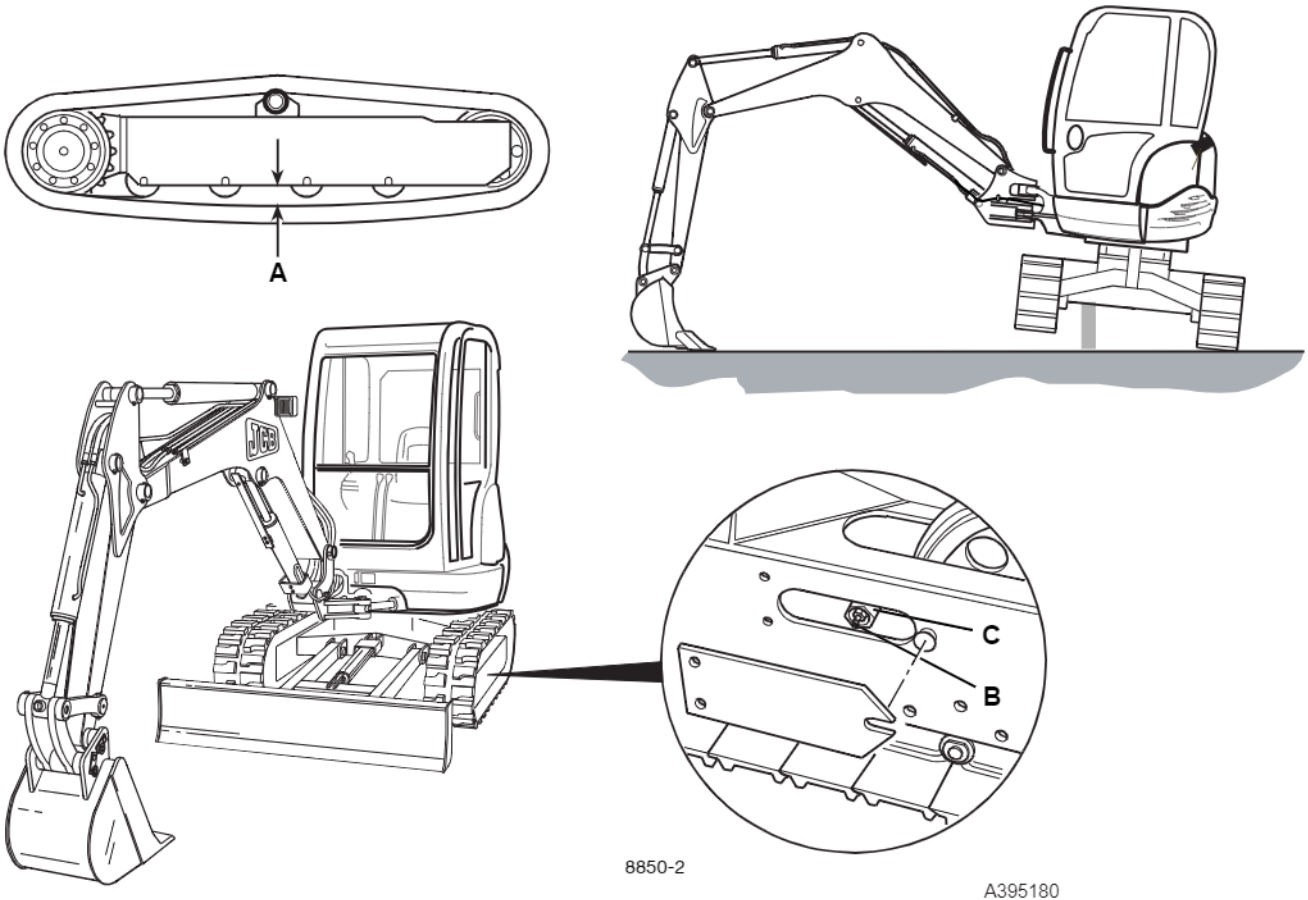
TRACKS AND RUNNING GEAR - continued



TRACKS AND RUNNING GEAR - continued

WARNING

Recoil servicing must only be carried out by JCB distributors. You could be killed or injured if you tamper with it.

Checking the Track Tension

1 Park the machine on level ground. Run it backwards and forwards several times. Position the machine as shown with the track to be tensioned raised from the ground and the undercarriage supported.

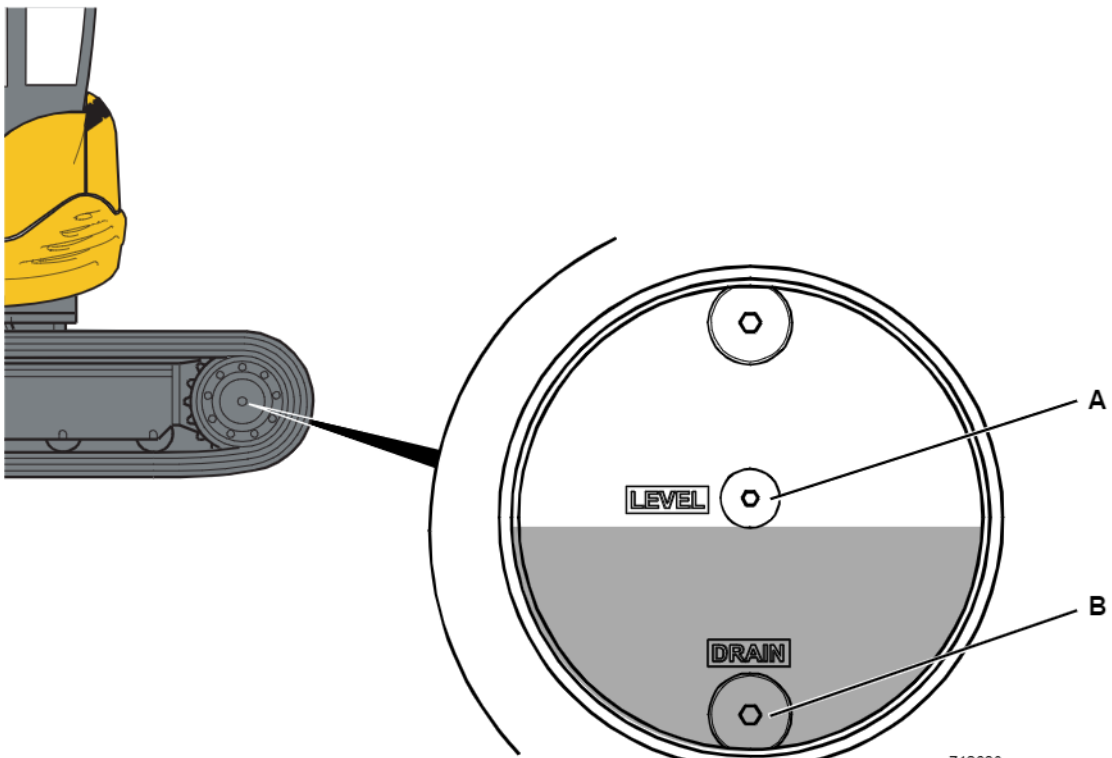
2 Check that the tension measured at **A** is between 70 mm (2.8 in.) and 90 mm (3.6 in.) for a rubber track or 120 mm (4. 8in.) for a steel track.

CAUTION

Always make sure that the track tension measurement is not less than specified or severe strain to the track will result.

3 Remove the screws and the access plate. To tighten the track, pump grease (see **Lubricants and Capacities**) through nipple **B** in adjusting screw **C** until track tension is correct. Rotate track and re-check dimension. To slacken the adjustment slacken adjusting screw **C** to allow grease to escape, until the correct tension is achieved. Rotate the track and re-check dimension. Replace and secure the access plate. Lower the track to the ground.

TRACKS AND RUNNING GEAR - continued



TRACKS AND RUNNING GEAR - continued

Checking the Track Gearbox Oil Level

1 Position the machine on firm level ground. Ensure that the gearbox plugs **A** and **B** are positioned as shown. Stop the engine and remove starter key.

2 Clean the area around the fill/level plug **A** and remove the plug, oil should be seen to be level with the hole. Top up as necessary, for the correct oil see **Lubricants and Capacities** at the end of the section. Clean and refit the plug, make sure it is tight.

Changing the Track Gearbox Oil

1 Position the machine on firm level ground.

2 Place a suitable container beneath the drain plug **B** to collect the oil.

CAUTION

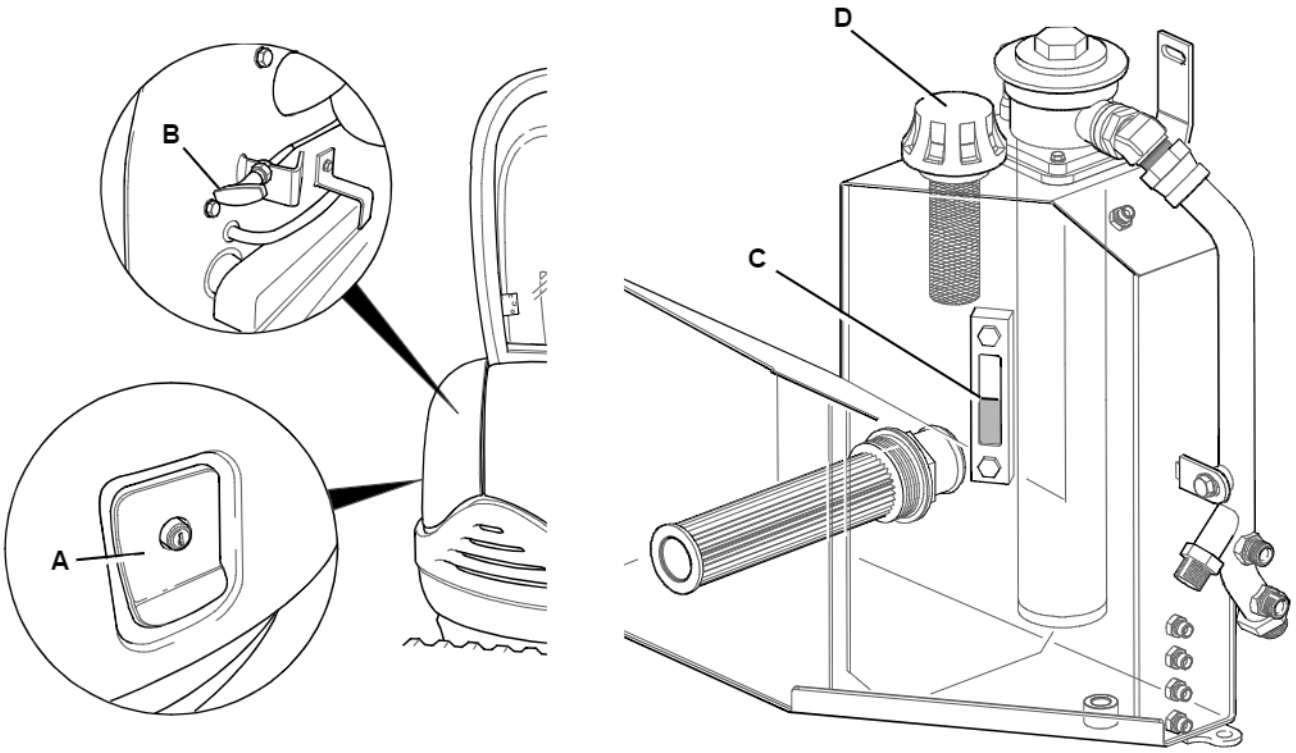
Oil will gush from the hole when the plug is removed. Keep to one side when you remove the drain plug.

3 Remove level filler plug **A**. Remove the drain plug **B**. Allow the oil to drain out. Wipe the drain plug clean. Make sure that you remove all metal particles. Refit the drain plug. Make sure it is tight.

4 Fill with new oil through the fill/level plug hole until oil runs from the hole. For the correct oil to use see **Lubricants and Capacities**.

5 Run the machine, operate the track controls and then make sure there are no leaks.

HYDRAULIC SYSTEM



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HYDRAULIC SYSTEM - continued

WARNING

Fine jets of hydraulic oil at high pressure can penetrate the skin. Do not use your fingers to check for leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks, then inspect the cardboard for evidence of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

Checking the Fluid Level

1 Park the machine on firm level ground and retract all rams. Stop the engine and remove the starter key.

2 Gain access to the hydraulics bay, by opening the engine bay cover **A**, and releasing the hydraulics bay catch by pulling handle **B**.

3 Check the hydraulic sight gauge **C**, located in the hydraulics bay, for correct level.

Adjusting the Fluid Level

1 Clean the area around the hydraulic tank filler cap **D**. Remove the filler cap.

2 Add fluid until the level in the sight gauge is correct. Ensure that only the correct grade of fluid is used. See Lubricants and Capacities.

3 Refit the filler cap and close the hydraulic bay cover.

Checking the Ram Piston Rods

1 Extend each ram fully, one at a time and visually examine for score marks, dents or similar defects. If a ram piston rod appears defective contact your service engineers or JCB dealer.

BATTERY

The following warning symbols may be found on the battery.

Keep away from children.

Shield eyes.

No smoking, no naked flames, no sparks.

Explosive gas.

Battery acid.

Note operating instructions.

H17610

WARNING

Do not disconnect the battery while the engine is running, otherwise the electrical circuits may be damaged. Int-3-1-14

WARNING

Understand the electrical circuit before connecting or disconnecting an electrical component. A wrong connection can cause injury and/or damage. Int-3-1-4

WARNING

Battery electrolyte is toxic and corrosive. Do not breath the gases given off by the battery. Keep the electrolyte away from your clothes, skin, mouth and eyes. Wear safety glasses. Int-3-2-1/3

WARNING

Damaged or spent batteries and any residue from fires or spillage should be put in a closed acid proof receptacle and must be disposed of in accordance with local environmental waste regulations. Int-3-1-12

BATTERY - continued

WARNING

Batteries give off an explosive gas. Do not smoke when handling or working on the battery. Keep the battery away from sparks or naked flames.

Battery electrolyte contains sulphuric acid. It can burn if it contacts skin or eyes. Wear goggles and handle the battery carefully to prevent spillage.

Keep metallic items (watches, rings zippers etc.) away from the battery terminals. Such items could cause a short and burn you.

Set all switches in the cab to OFF before disconnecting or reconnecting the battery. When disconnecting the battery remove the earth (-) lead first. When reconnecting, fit the positive (+) lead first.

Recharge the battery away from the machine, in a well ventilated area. Switch the charging circuit off before connecting or disconnecting the battery. When the battery is reinstalled in the machine, wait five minutes before connecting it up.

First Aid - Electrolyte

Do the following if electrolyte:

Gets in your eyes

Immediately flush with water for 15 minutes, always get medical help.

Is swallowed

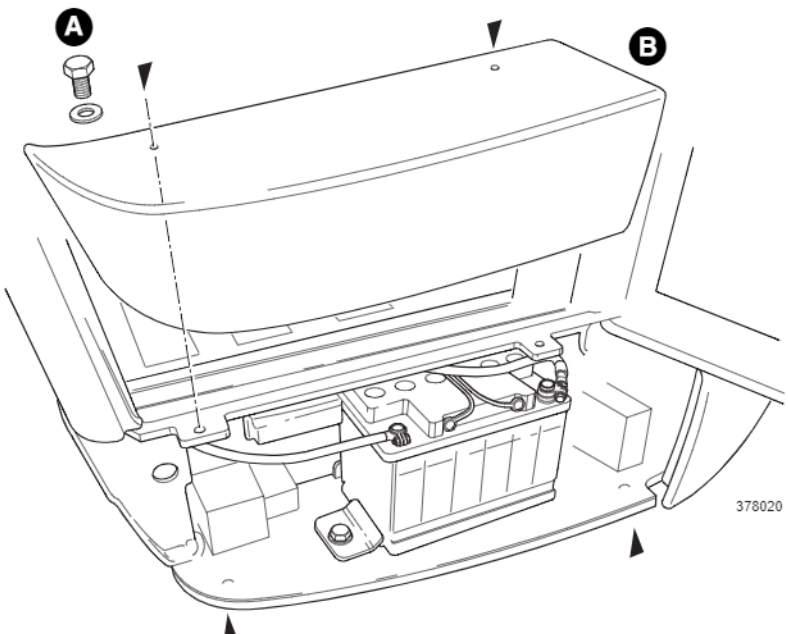
Do not induce vomiting, drink large quantities of water or milk. Then drink milk of magnesia, beaten egg or vegetable oil. Get medical help.

Gets onto your skin

Flush with water, remove affected clothing, cover burns with a sterile dressing, then get medical help.

5-3-4-3/1

BATTERY - continued



BATTERY - continued

WARNING

Batteries give off explosive gases. Keep flames away from the battery. Do not smoke close to the battery. Make sure there is good ventilation in closed areas where batteries are being used or charged. Do not check the battery charge by shorting the terminals with metal; use a hydrometer or voltmeter.

Int-3-1-8

WARNING

Do not top the battery up with acid. The electrolyte may boil out and burn you. 2-3-4-8

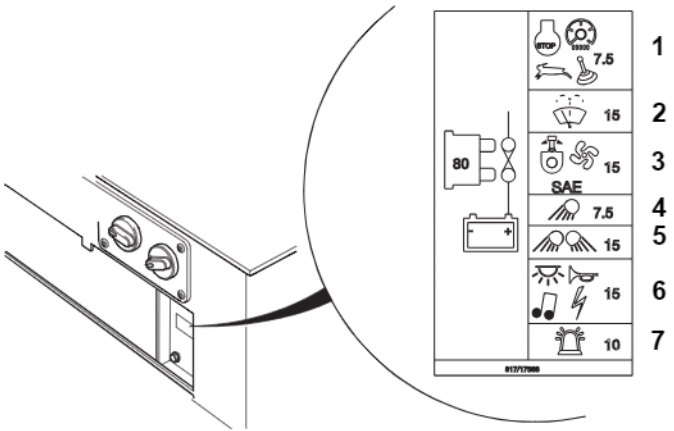
Checking the Electrolyte Level

Maintenance free batteries used in normal temperate climates applications should not need topping up. However, in certain conditions (such as prolonged operation at tropical temperatures or if the alternator overcharges) the electrolyte level should be checked. Gain access to the battery as described below.

1 Remove the bolts **A** securing the left hand mainframe skirt **B**

2 Remove the skirt **B**.

FUSES



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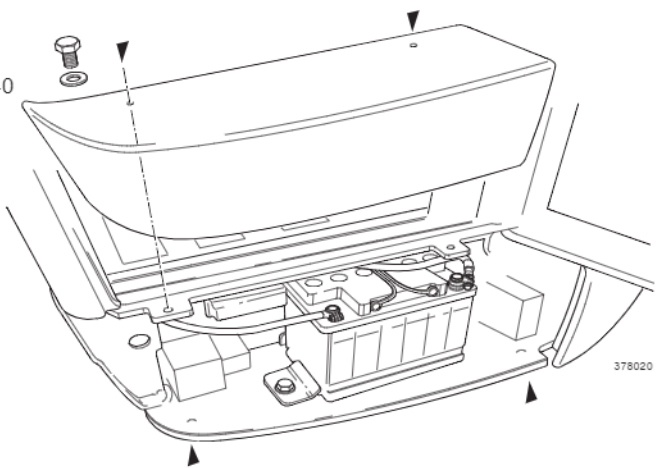


FUSES - continued

The electrical circuits are protected by fuses.
If a fuse blows, find out why before fitting a new one.

Primary Fuse Circuit Rating 80 A

Secondary Fuse Circuit Rating

1	Instruments, Engine stop solenoid, Two-speed circuit, Servo solenoid.	7.5 A
2	Wash/Wipe Circuit	15 A
3	Slew/Swing circuit, SAE control, Heater Blower.	15 A
4	Boom light	7.5 A
5	Work lights	15 A
6	Interior light, Horn, Radio, Accessory Power socket,	15A
7	Beacon	10 A

CAUTION

Always replace fuses with ones of the correct ampere rating to avoid damage to the electrical system.

Bulbs	**Rating**
Cab lights	10 W
Work lights	55 W
Beacon	55 W

The secondary fuses are located in the toolbox under the seat. The primary fuse is located in the battery compartment, below the cab door.

FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS

Note: New engines do not require a running in period. The engine/machine should be used in normal work cycle immediately; glazing of the piston cylinder bores, resulting in excessive oil consumption, could occur if the engine is gently run in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load). Engines of new machines are filled at the factory with JCB 10w/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown below. JCB 10W/30 should also be used for the first 50 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours it is essential that the 10W/30 oil is replaced by the lubricant recommended below.

ITEM	CAPACITY Litres (UK Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Fuel Tank	43.0 (11.4)	Diesel oil	ASTM D975-66T Nos. 1D,2D
Engine Oil	4.5 (1.2)	**JCB 10W/30 Multigrade** above -15 deg C (5 deg F) **5W/20** -15 deg C to -25 deg C (5 deg F to -13 deg F)	MIL-L-46152,API CF/SF API CF/SE (recommended)
After First 100 Hours		**JCB 15W/50 Multigrade** above -10 deg C (14 deg F) **5W/20** -10 deg C to -25 deg C (14 deg F to -13 deg F)	S.A.E. 15W/40, MIL-L-46152B, API CF/SE, MIL-L-2104D API CC/SE or API CD/SE
Engine Coolant -Canopy -Cab	 6.5 (1.7) 7.0 (1.5)	**JCB 4 Seasons Antifreeze and Summer Coolant** See coolant mixtures	ASTM D3306-74

FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS - continued

ITEM	CAPACITY Litres (UK Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Track Motor Capacity 8027Z 8032Z	 0.8 (0.176) 0.7 (0.154)	**S.A.E. 30 CD Engine oil** Not Multigrade	API-CD/SF, MIL-L-46152B, MIL-L-2104B
Slew Gearbox	Lubricated from hydraulic system		
Track Idler Wheels	0.075 (0.02)	**JCB HD 90 Gear Oil**	API-GL-5, MIL-L-2105D
Track Roller Top	0.03 (0.009)	**JCB HD 90 Gear Oil**	API-GL-5, MIL-L-2105D
Track Roller Bottom	0.075 (0.02)	**JCB HD 90 Gear Oil**	API-GL-5, MIL-L-2105D
Hydraulic System	70 (15.4)	**JCB Special Hydraulic Fluid** up to 86°F (30°C) **JCB Hydraulic Fluid 46** over 86°F (30°C)	

FLUIDS, LUBRICANTS, CAPACITIES AND SPECIFICATIONS - continued

ITEM	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Swing Ring Bearings Swing Ring Gear Teeth	**JCB MPL Grease** **JCB Slew Pinion Grease**	Lithium based no 2 consistency
All Other Grease Points	**JCB MPL Grease**	Lithium based no 2 consistency

OBTAINING REPLACEMENT PARTS

We recommend that you fit only JCB Genuine Parts. For a complete machine parts listing consult your dealer. Your dealer will need to know the exact identity of your machine.

The machine has a data plate. This shows the machine and engine serial numbers.

If the engine has been changed, the serial numbers on the data plate may be wrong. Check on the engine itself.

WARNING

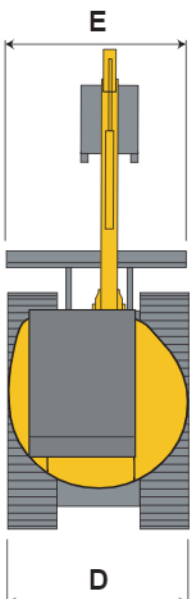
Some parts of you machine may have Warning Decals attached. Before you fit a replacement parts make sure it has its warning decal fixed in its correct position.
Contact your dealer if the decal is missing.

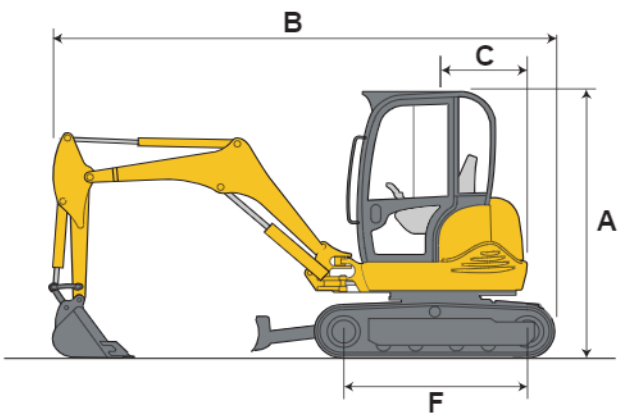
NOISE AND VIBRATION DATA

Typical duties for machine: Tracking (Blacktop)
Tracking (Rough Terrain)
Excavating

	8027Z	8032Z
Noise (Dynamic Noise Labels)		
1 Noise Level at Operators Ear		
Canopy	95 dB LpA	95 dB LpA
Cab	95 dB LpA	95 dB LpA
External Noise Level		
Canopy	<79 dB LwA	<79 dB LwA
Cab	<79 dB LwA	<79 dB LwA
Vibration		
3 Weighted rms acceleration		
Whole Body (m/s^2)	1.3 m/s^2	1.3 m/s^2
4 Weighted rms acceleration		
Hand/Arm (m/s^2) - Less than	< 2.5 m/s^2	< 2.5 m/s
Engine		
1 Max. Engine speed - Rated	2420 rev/min	2420 rev/min

STATIC DIMENSIONS





STATIC DIMENSIONS - continued

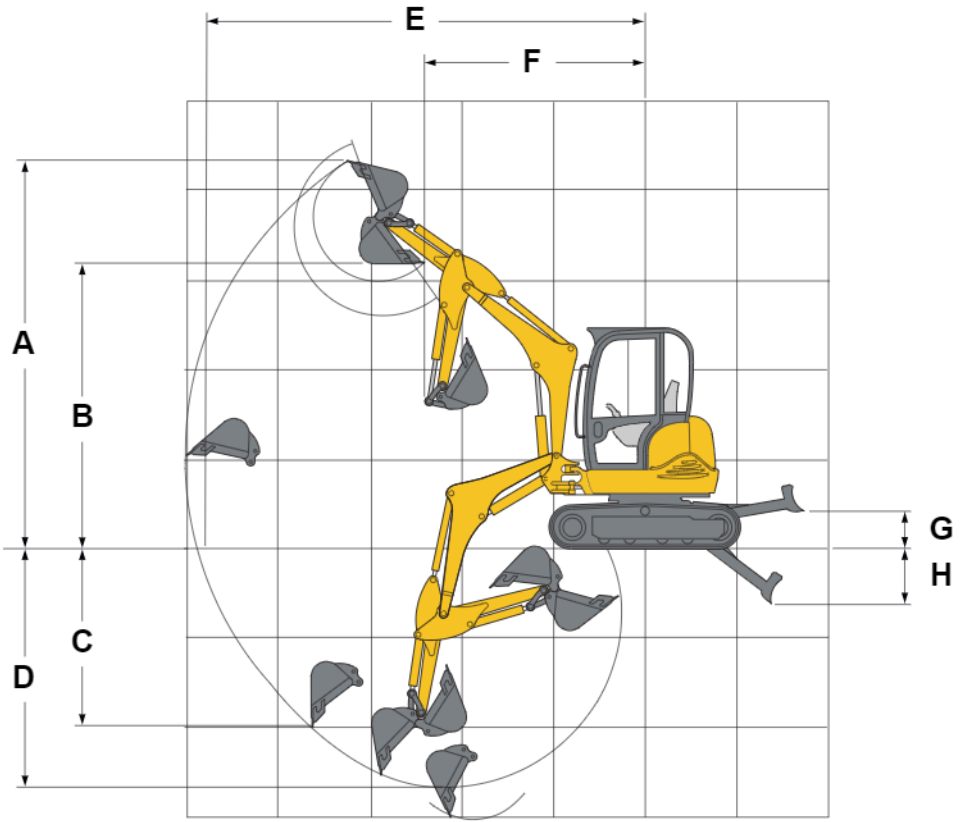
		8027Z 1100 mm Dipper		8032Z 1100 mm Dipper		8032Z 1250 mm Dipper	
A	Overall Height (Transport Position)	2481	mm#	2481	mm#	2481	mm#
B	Length (Transport Position)	4426	mm	4426	mm	4384	mm
C	Tailswing	795	mm	795	mm	795	mm
D	Overall Width	1600	mm	1650	mm	1650	mm
E	Overall Track Length	2076	mm	2076	mm	2076	mm
F	Track Centres	1598	mm	1585	mm	1585	mm
	Dozer Width	1600	mm	1650	mm	1650	mm
Operating Weight*							
	Cab	2963	kg	3361	kg	3367	kg
	Canopy	2823	kg	3221	kg	3227	kg
Transport Weight							
	Cab	2888	kg	3286	kg	3292	kg
	Canopy	2748	kg	3211	kg	3152	kg

*Operating weights to ISO 6016 including rubber tracks, quoted dipper, standard dozer, 460mm bucket, full tanks and 75kg operator.

 # WARNING

Does not include transporter height.

PERFORMANCE DIMENSIONS



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PERFORMANCE DIMENSIONS - continued

	8027Z	8032Z
A Max Digging Height	4264 mm	4346 mm
B Max Dumping Height	3107 mm	3192 mm
C Max Vertical Digging Depth	1843 mm	1973 mm
D Max Digging Depth	2510 mm	2646 mm
E Max Reach (Ground Level)	4714 mm	4855 mm
F Min Boom Swing Radius	2293 mm	2304 mm
G Blade Cut Above Ground	*414 mm	*414 mm
H Blade Cut Below Ground	*622 mm	*622 mm

*Figures with Standard Long Dozer

9801/8850