OPERATOR'S MANUAL

COMPACT LOADALL (ROUGH TERRAIN VARIABLE REACH TRUCK)

525-60

EN - 9821/9100
ISSUE 5 - 06/2016

THIS MANUAL SHOULD ALWAYS STAY WITH THE MACHINE

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This manual contains original instructions, verified by the manufacturer (or their authorized representative).

www.jcb.com

Foreword

The Operator's Manual

⚠

You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

Machine Delivery and Installation

Even if you have operated this type of equipment before, it is very important that your new machines operations and functions are explained to you by a JCB Dealer Representative following delivery of your new machine.

Following the installation you will know how to gain maximum productivity and performance from your new product.

Please contact your local JCB dealer if the Installation Form (included in this manual) has not yet been completed with you.

Your local JCB Dealer is

Notes:

Contents **Page No.**

Technical Data

Acronyms Glossary

ARV	Auxiliary Relief Valve
CESAR	Construction Equipment Security and Registration
DEF	Diesel Exhaust Fluid
ECU	Electronic Control Unit
FEAD	Front End Accessory Drive
FOPS	Falling Object Protective Structure
HVAC	Heating Ventilation Air Conditioning
ISO	International Organization for Standardization
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LLMC	Longitudinal Load Moment Control
LLMI	Longitudinal Load Moment Indicator
LMI	Load Moment Indicator
MRV	Main Relief Valve
PIN	Product Identification Number
PPE	Personal Protective Equipment
RMS	Root Mean Square
ROPS	Roll-Over Protective Structure
RPM	Revolutions Per Minute
SAE	Society of Automotive Engineers
SRS	Smooth Ride System
SWL	Safe Working Load

Introduction

About this Manual

Model and Serial Number

This manual provides information for the following model(s) in the JCB machine range:

Model	From:	To:
525-60	1709724	

Using the Manual

This operator's manual is arranged to give you a good understanding of the machine and its safe operation. It also contains maintenance and technical data.

Read this manual from the front to the back before you use the machine for the first time, even if you have used machines of a similar/same type before as the technical specification, systems and controls of the machine may have changed. Particular attention must be given to all the safety aspects of operating and maintaining the machine.

If there is anything you are not sure about, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

The general and specific warnings in this section are repeated throughout the manual. Read all the safety statements regularly, so you do not forget them. Remember that the best operators are the safest operators.

The illustrations in this manual are for guidance only. Where the machines are different, the text and or the illustration will specify.

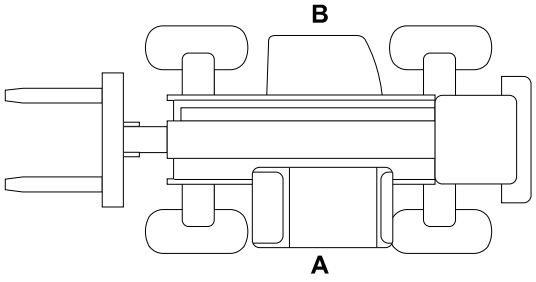
The manufacturer's policy is one of continuous improvement. The right to change the specification of the machine without notice is reserved. No responsibility will be accepted for discrepancies which may occur between specifications of the machine and the descriptions contained in this manual.

All of the optional equipment included in this manual may not be available in all territories

Left-Hand Side, Right-Hand Side

In this manual, 'left' and 'right' mean your left and right when you are seated correctly in the machine.

Figure 1.



A Left **B** Right

Cab/Canopy

This manual frequently makes references to the cab. For example, 'do not operate the machine without an operator's manual in the cab'. These statements also apply to canopy build machines.

Cross References

In this manual, cross references are made by presenting the subject title in blue (electronic copy only). The number of the page upon which the subject begins is indicated within the brackets. For example: Refer to: Introduction > About this Manual > Cross References (Page 2).

Safety

Safety - Yours and Others

All machinery can be hazardous. When a machine is correctly operated and maintained, it is a safe machine to work with. When it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this manual and on the machine you will find warning messages, read and understand them. They inform you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or JCB dealer to explain them.

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 of 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 work until you are sure that you and those around you will be safe.

If you are not sure of anything, about the machine or the work, ask someone who knows. Do not assume anything.

Remember:

- Be careful
- Be alert
- Be safe.

Safety Warnings

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

The signal word 'DANGER' indicates a hazardous situation which, if not avoided, will result in death or serious injury.

The signal word 'WARNING' indicates a hazardous situation which, if not avoided, could result in death or serious injury.

The signal word 'CAUTION' indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The signal word 'Notice' indicates a hazardous situation which, if not avoided, could result in machine damage.

The safety alert system (shown) also helps to identify important safety messages in this manual and on the machine. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

Figure 2. The safety alert system

General Safety

Training

To operate the machine safely you must know the machine and have the skill to use it. You must abide by all relevant laws, health and safety regulations that apply to the country you are operating in. The operator's manual 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 machine 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. In some markets and for work on certain jobsites you may be required to have been trained and assessed in accordance with an operator competence scheme. Make sure that you and your machine complies relevant local laws and jobsite requirements - it is your responsibility.

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.

Clothing

You can be injured if you do not wear the correct clothing. Loose clothing can get caught in the machinery. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained. Remove rings, watches and personal jewellery.

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 while operating the machine or attachments. Be aware of medicines which can cause drowsiness.

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.

Mobile Phones

Switch off your mobile phone before entering an area with a potentially explosive atmosphere. Sparks in such an area could cause an explosion or fire resulting in death or serious injury.

Switch off and do not use your mobile phone when refuelling the machine.

Lifting Equipment

You can be injured if you use incorrect or faulty lifting equipment. You must identify the weight of the item to be lifted then choose lifting equipment that is strong enough and suitable for the job. Make sure that lifting equipment is in good condition and complies with all local regulations.

Raised Equipment

Never walk or work under raised equipment unless it is supported by a mechanical device. Equipment which is supported only by a hydraulic device can drop and injure you if the hydraulic system fails or if the control is operated (even with the engine stopped).

Make sure that no-one goes near the machine while you install or remove the mechanical device.

Raised Machine

Never position yourself or any part of your body under a raised machine which is not correctly supported. If the machine moves unexpectedly you could become trapped and suffer serious injury or be killed.

Lightning

Lightning can kill you. Do not use the machine if there is lightning in your area.

Machine Modifications

This machine is manufactured in compliance with prevailing legislative requirements. It must not be altered in any way which could affect or invalidate its compliance. For advice consult your JCB dealer.

Clothing and Personal Protective Equipment (PPE)

Do not wear loose clothing or jewellery that can get caught on controls or moving parts. Wear protective clothing and personal safety equipment issued or called for by the job conditions, local regulations or as specified by your employer.

Notes:

About the Product
Introduction

General

Before you start using the machine, you must know how the machine operates. Use this part of the manual to identify each control lever, switch, gauge, button and pedal. Do not guess, if there is anything you do not understand, ask your JCB dealer.

Name and Address of the Manufacturer

JCB Excavators Limited, Lakeside Works, Rocester, Uttoxeter, United Kingdom, ST145JP

Product Compliance

Your JCB product was designed to comply with the laws and regulations applicable at the time of its manufacture for the market in which it was first sold. In many markets, laws and regulations exist that require the owner to maintain the product at a level of compliance relevant to the product when first produced. Even in the absence of defined requirements for the product owner, JCB recommend that the product compliance be maintained to ensure safety of the operator and exposed persons and to ensure the correct environmental performance. Your product must not be altered in any way which could affect or invalidate any of these requirements. For advice consult your JCB dealer.

For its compliance as a new product, your JCB and some of its components may bear approval numbers and marking's, and may have been supplied with a Declaration/Certificate of Conformity. These marking's and documents are relevant only for the country/region in which the product was first sold to the extent that the laws and regulations required them.

Re-sales and import/export of products across territories with different laws and regulations can cause new requirements to become relevant for which the product was not originally designed or specified. In some cases, pre owned products irrespective of their age are considered new for the purposes of compliance and may be required to meet the latest requirements which could present an insurmountable barrier to their sale/use.

Despite the presence of any compliance related marking's on the product and components, you should not assume that compliance in a new market will be possible. In many cases it is the person responsible for import of a pre owned product into a market that becomes responsible for compliance and who is also considered the manufacturer.

JCB may be unable to support any product compliance related enquiry for a product which has been moved out of the legislative country/region where it was first sold, and in particular where a product specification change or additional certification would have been required in order for the product to be in compliance.

Description

General

The JCB Loadall is a self propelled, seated operator, wheeled machine for operation on unimproved natural terrain and disturbed terrain.

A main structural support is designed to carry an extending boom with a carriage mounted on the front to which forks or an approved attachment can be fitted.

When used normally the machine lifts and places loads by extending/retracting, raising/lowering the boom.

Intended Use

The machine is intended to be used in normal conditions for the applications described in this manual. If the machine is used for other applications or in dangerous environments, for example in a flammable atmosphere or in areas with dust containing asbestos, special safety regulations must be obeyed and the machine must be equipped for use in these environments.

Log Moving/Object Handling

Do not use the machine to move or handle logs unless sufficient log protection is installed. You could cause serious injury to yourself and damage to the machine. For more information, contact your JCB dealer.

Optional Equipment and Attachments

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

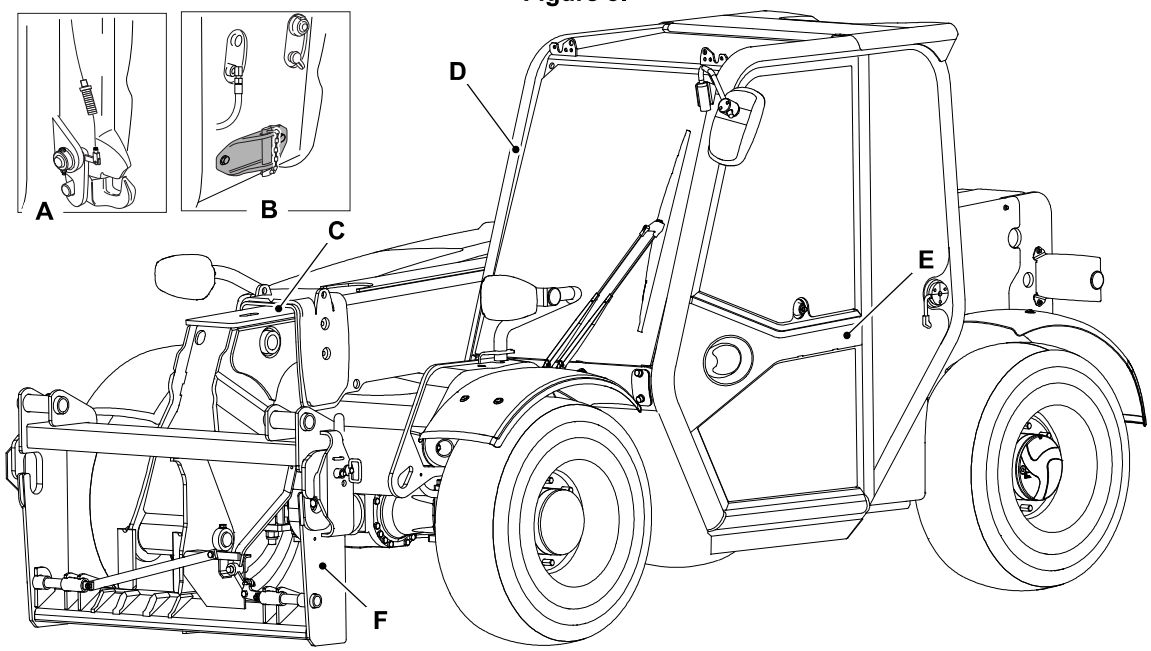
Danger Zone

The danger zone is any zone within and/or around the machinery in which a person is subject to a risk to their health or safety. The danger zone includes the area in immediate proximity to any hazardous moving parts, areas into which working equipment and attachments can be moved to quickly, the machine normal stopping distances and also areas into which the machine can quickly turn under normal conditions of use. Depending on the application at the time, the danger zone could also include the area into which debris, from use of an attachment or working tool, could be projected and any area into which debris could fall from the machine. During the operation of the machine, keep all persons out of the danger zone. Persons in the danger zone could be injured.

Before you do a maintenance task, make the product safe.

Main Component Locations

Figure 3.



A Hydraulic tow hitch (option)
B Mechanical tow hitch (option)
C Boom
D ROPS (Roll-Over Protective Structure)/FOPS (Falling Object Protective Structure) cab
E Door
F Carriage

Product and Component Identification

Machine

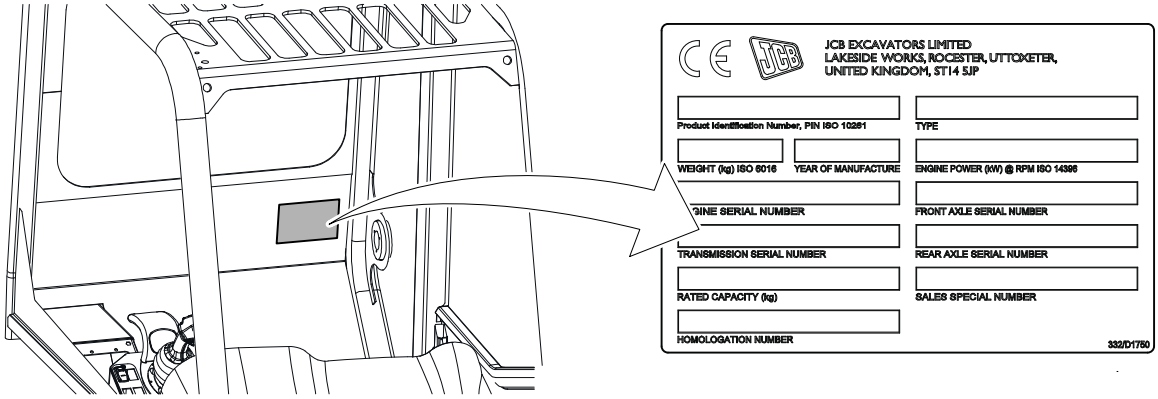
Machine Identification Plate

Your machine has an identification plate mounted as shown. The serial numbers of the machine and its major units are shown on the plate.

The machine model and build specification is indicated by the PIN (Product Identification Number)

The serial number of each major unit is also shown on the unit itself. If a major unit is replaced by a new one, the serial number on the identification plate will be wrong. Either get a replacement identification plate from your JCB Dealer or simply remove the old number. This will prevent the wrong unit number being quoted when replacement parts are ordered. The machine and engine serial numbers can help identify exactly the type of equipment you have.

Figure 4.



Typical Product Identification Number

The machine model and build specification are indicated by the PIN. The PIN has 17 digits and must be read from left to right.

Table 1. Typical PIN

JCB	5A4	1	R	C	12345678

Table 2.

Digit 1 to 3	World Manufacturer Identification
JCB	United Kingdom
GEO	Georgia, US
HAR	Haryana, India
SOR	Sorocaba, Brazil
GET	Gatersleben, Germany
PUN	Pune, India
SHA	Shanghai, China
JBP	JCB Branded Products

Table 3.

Digit 4 to 6
Machine model and type

Table 4.

Digit 7	Engine Model
1	55kW KOHLER T4F
2	81kW JCB T4F
3	93kW JCB T4F
4	108kW JCB T4F
5	58kW HAR N/A
6	Reserved: 68kW HAR TURBO
7	Reserved: 55kW JCB T4F
9	55kW KOHLER- Non-regulated
J	63kW JCB T2
K	74.2kW JCB T2
P	85kW JCB T3
R	97kW JCB T3
S	74.2kW JCB T3
T	83kW JCB T3
V	108kW JCB T3
W	55kW JCB T4
X	81kW JCB T4
Y	83kW JCB T4
Z	108kW JCB T4

Table 5.

Digit 8	Gearbox Model
E	3 Speed (PS750)
F	3 Speed (PS760)
G	4 Speed (PS750)
H	4 Speed (PS760)
J	6 Speed (PS760)
M	4 Speed (SS700)
N	4 Speed (PS750)
P	HYDRO 20km/h (12.4mph)
R	HYDRO 25km/h (15.5mph)
S	HYDRO 34km/h (21.1mph)
T	HYDRO 40km/h (24.9mph)
V	HYDRO 30km/h (18.6mph)

Table 6.

Digit 9
Random check letter. The check letter is used to verify the authenticity of a machine's PIN

Table 7.

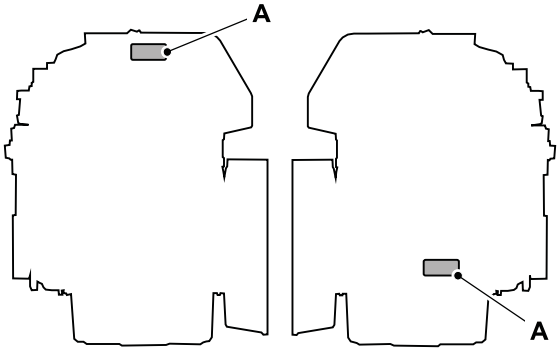
Digit 10 to 17
Machine serial number. Each machine has a unique serial number.

Engine

The engine data labels are attached to the cylinder block as shown. Refer to Figure 5.

The data label includes the engine identification number.

Figure 5.

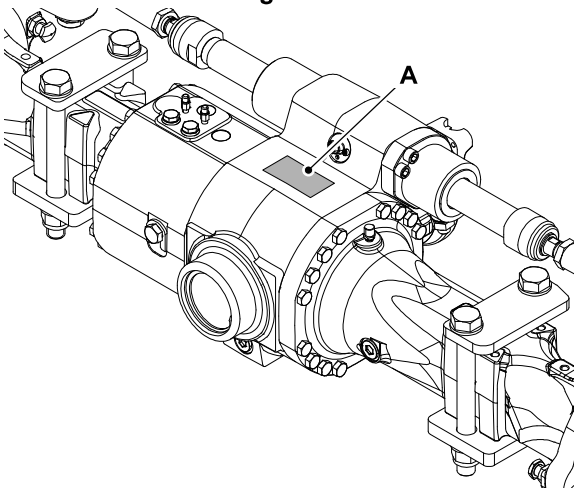


A Engine data label

Axle

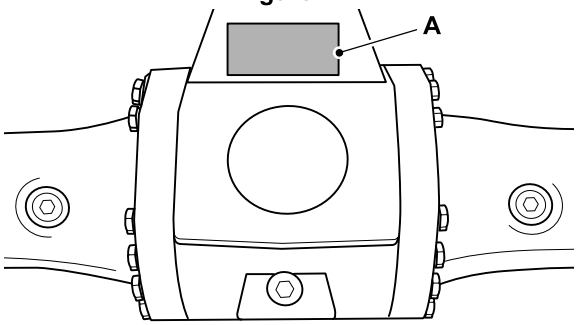
The axles have a serial number stamped on a data plate label as shown.

Figure 6.



A Data plate - front axle

Figure 7.

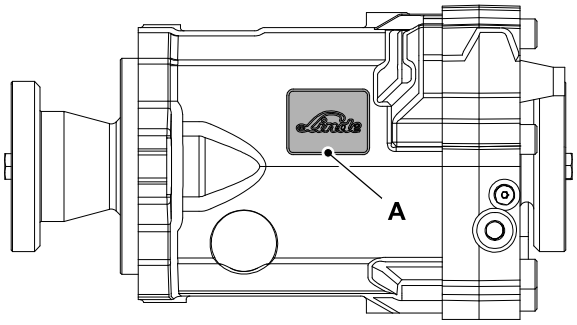


B Data plate - rear axle

Gearbox

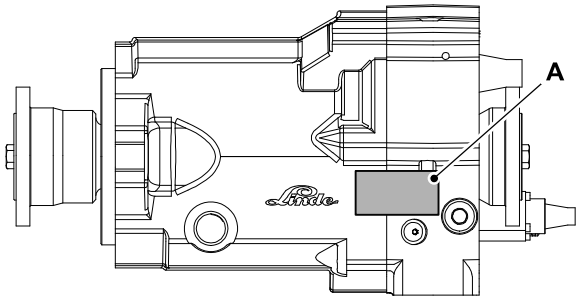
The gearbox has a serial number stamped on a data plate as shown.

Figure 8. Transmission - 135cc



A Data plate

Figure 9. Transmission - 165cc



A Data plate

Operator Protective Structure

⚠ **WARNING** You could be killed or seriously injured if you operate a machine with a damaged or missing ROPS/FOPS/FOGS. If the ROPS/FOPS/FOGS has been in an accident, do not use the machine until the structure has been renewed. Modifications and repairs that are not approved by the manufacturer may be dangerous and will invalidate the ROPS/FOPS/FOGS certification.

WARNING Machines with a ROPS, FOPS,FOGS or TOPS are equipped with a seat belt. The ROPS, FOPS,FOGS or TOPS is designed to give you protection in an accident. If you do not wear the seat belt you could be thrown off the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.

FOPS Data Plate

⚠ **WARNING** Do not use the machine if the falling objects protection level provided by the structure is not sufficient for the application. Falling objects can cause serious injury.

If the machine is used in any application where there is a risk of falling objects then a FOPS (Falling Object Protective Structure) must be installed. For further information, contact your JCB dealer.

The FOPS has a data plate attached. The data plate indicates what level of protection the structure provides.

There are two levels of FOPS:

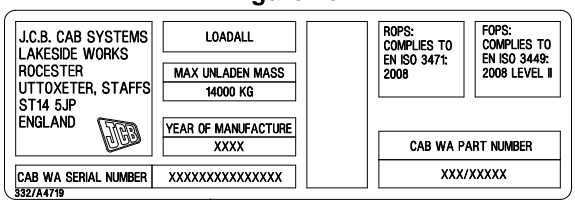
- Level I Impact Protection - impact strength for protection from small falling objects (e.g. bricks, small concrete blocks, hand tools) encountered in operations such as highway maintenance, landscaping and other construction site services.
- Level II Impact Protection - impact strength for protection from heavy falling objects (e.g. trees, rocks) for machines involved in site clearing, overhead demolition or forestry.

ROPS Data Plate

⚠ **WARNING** Your machine may be fitted with a Roll-Over Protective Structure (ROPS) indicating that the purchaser specified the machine for use in applications where there is risk of roll-over. ROPS is a device to protect the operator in the event of roll-over. Any damage or modification to the structure may invalidate the ROPS certification. If damage has occurred then an authorised JCB dealer should be consulted.

A machine with a ROPS (Roll-Over Protective Structure) can be identified by referring to the cab identification plate. Work place (work site, job site) risk assessment should facilitate the machine selection and the need for an machine with a ROPS.

Figure 10.



Data plate - ROPS/FOPS standards

The mass shown in these data plate are a test mass and the maximum operating mass of this machine may be lower.

Safety Labels

General

⚠ **WARNING** Safety labels on the machine warn you of particular hazards. You can be injured if you do not obey the safety instructions shown.

The safety labels are strategically placed around the machine to remind you of possible hazards.

If you need eye-glasses for reading, make sure you wear them when reading the safety labels. Do not over-stretch or put yourself in dangerous positions to read the safety labels. If you do not understand the hazard shown on the safety label, then refer to Safety Label Identification.

Keep all of the safety labels clean and readable. Replace a lost or damaged safety label. Make sure the replacement parts include the safety labels where necessary. Each safety label has a part number printed on it, use this number to order a new safety label from your JCB dealer.

Safety Label Identification

Figure 11.

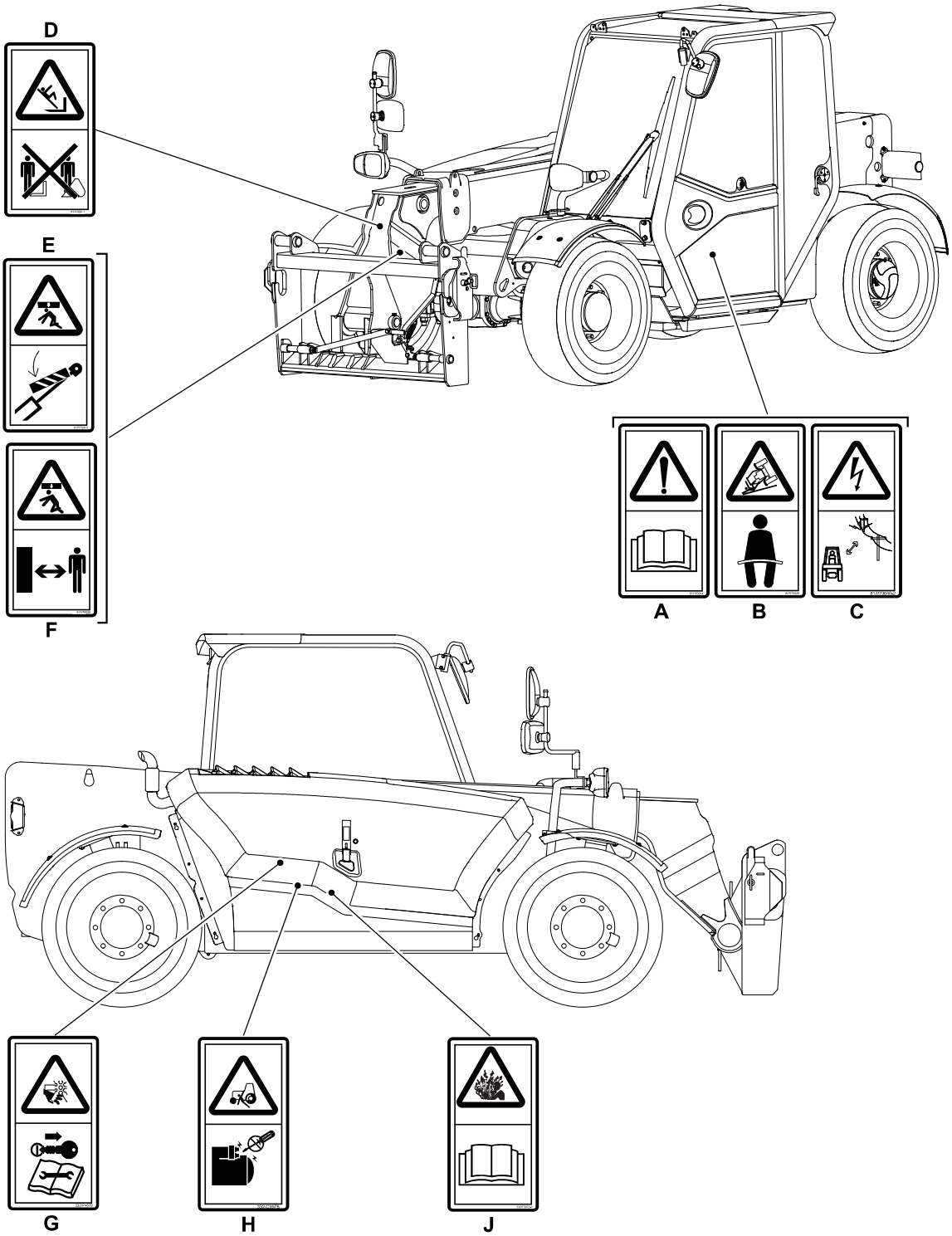


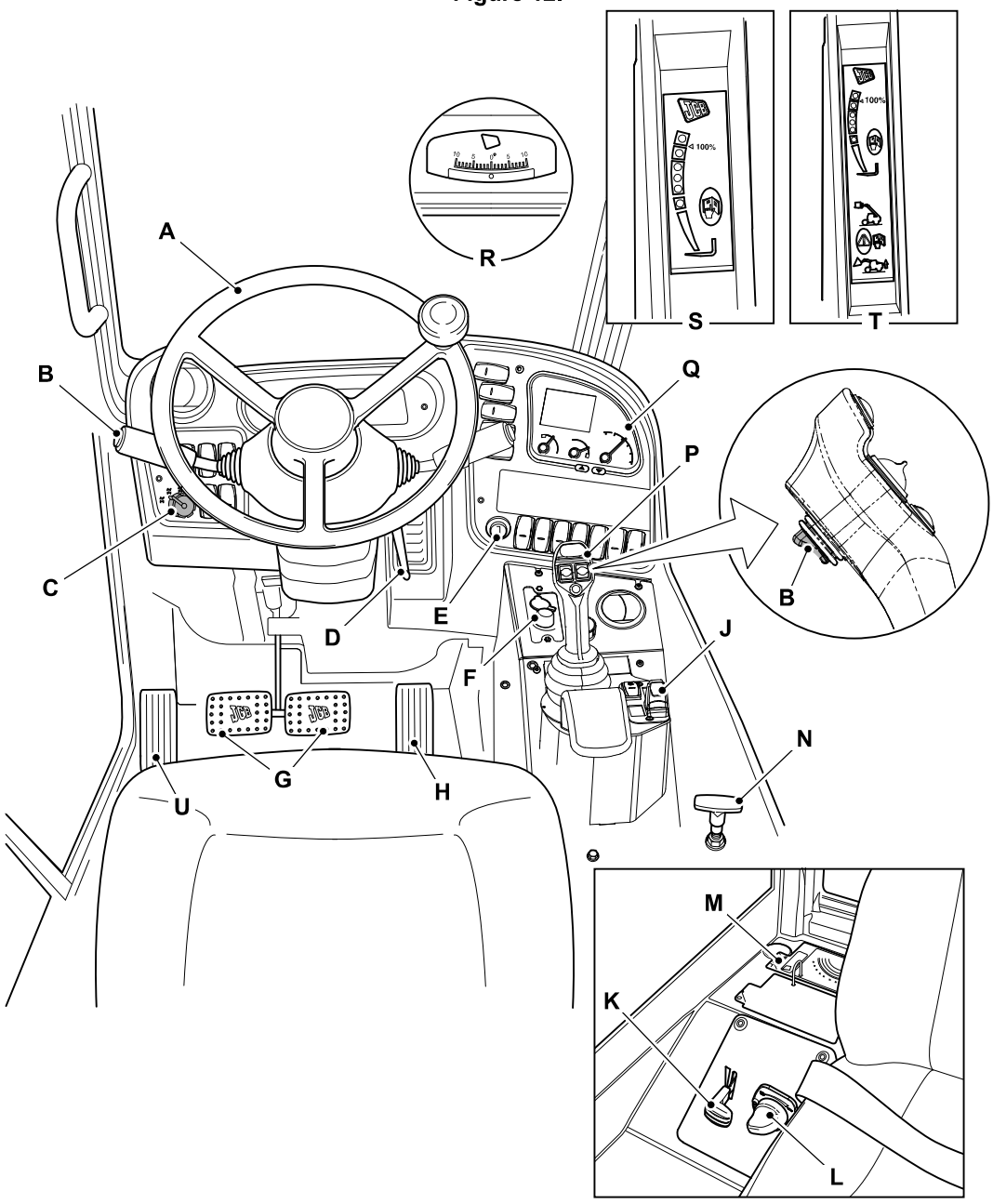
Table 8. Safety Labels

Item	Part No.	Description	Qty.
A	817/70014	Warning. Read the Operator's Manual before you operate the machine.	1
B	817/70029	Crush hazard. Wear seat belt.	1
C	817/70040	Electrical hazard. Stay a safe distance away from power lines.	1
D	817/70011	Fall from raised attachment. Do not stand or ride on the bucket or forks.	1
E	817/70010	Crushing of whole body. Insert the boom support device before you complete any service or maintenance work underneath the boom.	1
F	817/70008	Crushing of whole body. Keep a safe distance from machine.	1
G	332/P4679	Severing of hands and fingers. Keep clear of/do not reach into rotating parts. Read the Service Manual.	1
H	332/C9978	Run over hazard. Start the engine from the operator's seat only. Do not short across the terminals.	1
J	332/F5855	Pressure hazard. Read the Operator's Manual.	1

Operator Station

Component Locations

Figure 12.



A Steering wheel Refer to: Operation > Drive Controls > Steering Wheel (Page 62).

B Transmission lever and gear selection

C Steer mode selector Refer to: Operation > Drive Controls > Steer Mode Control (Page 67).

D Steering column adjustment Refer to: Operation > Drive Controls > Steering Column (Page 62).

E Starter switch Refer to: About the Product > Interior Switches > Ignition Switch (Page 25).

F HVAC (Heating Ventilation Air Conditioning) controls Refer to: Operation > Heating, Ventilating and Air-Conditioning (HVAC) (Page 116).

G Service brake pedal Refer to: Operation > Drive Controls > Service Brake Pedal (Page 64).

H Accelerator pedal Refer to: Operation > Drive Controls > Accelerator Pedal (Page 62).

J Handbrake/parkbrake mini lever Refer to: Operation > Drive Controls > Park Brake (Page 65).
K Hand throttle controls Refer to: Operation > Drive Controls > Hand Throttle Control (Page 62).
L Travel speed selector Refer to: Operation > Drive Controls > Travel Speed Selector (Page 63).
M Load charts
N Hydraulic tow hitch
P Operating lever Refer to: Operation > Operating Levers/Pedals (Page 89).
Q Instrument panel Refer to: Operation > Instruments > Instrument Panel (Page 69).
R Inclinometer
S LLMI (Longitudinal Load Moment Indicator)Refer to: Operation > Lifting and Loading > Longitudinal Load Moment Indicator (LLMI) (Page 98).
T LLMC (Longitudinal Load Moment Control)Refer to: Operation > Lifting and Loading > Load Motion Control System (Page 100).
U Inching pedal

Console Switches

General

The installed switches and their positions can change according to the specification of the machine.

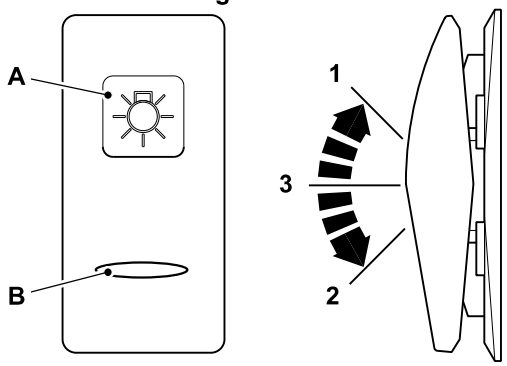
Each switch has a graphic symbol to show the function of the switch. Before you operate a switch, make sure that you understand its function.

The rocker switches have two or three positions (as shown).

If the switch has a backlight, then the graphic symbol illuminates when the ignition switch or side lights are in the on position.

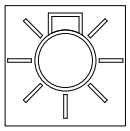
The light bar illuminates to show that the switch function is active.

Figure 13.



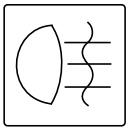
A Graphic symbol **B** Light bar

Road Lights



Three position rocker switch. The switch functions operate front sidelight, headlights and rear tail lights. Position 2 operates when the ignition is in the on and off positions. Position 3 operates when the ignition is in the on position. Machines without headlights or side lights are designed for site use. You may be breaking local laws if you travel on the road without headlights or side lights.
Position : 1 = Off
Position : 3 = Sidelights on.
Position : 2 = Headlights and rear tail lights on (ignition switch on).
Position : 2 = Sidelights and rear tail lights on (ignition switch off).

Rear Fog Lights



Two position rocker switch. The switch functions operate when the ignition switch is in the on position and the headlights are on.
Position **1**: Off
Position **2**: Rear fog light on

Hazard Warning Lights

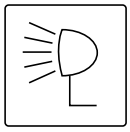
Two position rocker switch. The switch functions operate when the ignition switch is in the on and off positions.
Position : 1 = Off
Position : 2 = On. A light on the instrument panel flashes with the outside lights.

Work Lights

(If fitted) Three position rocker switch. The switch functions operate when the ignition switch is in the on position. The work lights work independently of the main circuit lights.
Position : 1 = Off
Position : 3 = Front work lights on
Position : 2 = Front/rear/hitch work lights on.

WARNING! *Do not drive on the road with the work lights switched on. You can interfere with other drivers visibility and cause an accident.*

Boom Work Light



Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Off
Position **2**: Boom worklight on

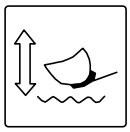
Information

Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Off
Position **2**: On (spring loaded - push then release to move to the next screen)

Tilt Lock

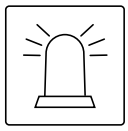
Two position rocker switch with backlight. The switch functions operate when the ignition switch is in the on position.
Position **1**: Off (Backlight off)
Position **2**: Tilt lock on (Backlight on)

Smooth Ride System (SRS)



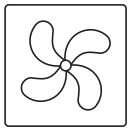
Three position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Off
Position **3**: On
Position **2**: Engage - Push and hold while you move the boom to the correct position.

Beacon



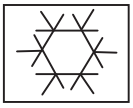
Two position rocker switch. The switch functions operate when the ignition switch is in the on and off positions.
Position : 1 = Off
Position : 2 = Beacon on

Heater



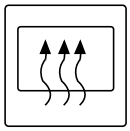
Three position rocker switch (spring loaded). The switch functions operate when the ignition switch is in the on position.
Position **1**: Fan speed down (springloaded)
Position **3**: Default position
Position **2**: Fan speed up (springloaded)

Air-Conditioning



Two position push switch. The switch functions operate when the ignition switch is in the on position.
Position : 1 = Off
Position : 2 = On

Window Heater

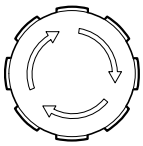


Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Heater rear/side windows off
Position **2**: Heater rear/side windows on

Controls Isolation

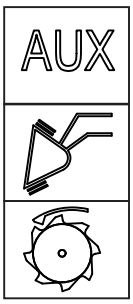
Two position rocker switch with backlight. The switch functions operate when the ignition switch is in the on position. Before you operate the switch, make sure you release the control lever locks.
Position **1**: Off
Position **2**: On

Hydraulic Function



Two position push switch. The switch functions operate when the engine is running.
Position **1**: Enable the hydraulic functions (turn the knob to the right then release).
Position **2**: Disable the hydraulic functions (push the knob).

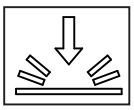
Hydraulic Mode



Three position rocker switch. The switch functions operate when the engine is running.
Position **1**: Aux/Aux II
Position **3**: Automatic bucket control system
Position **2**: Constant flow selector

Refer to: Operation > Operating Levers/Pedals (Page 89).

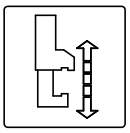
Hydraulic Venting



Two position rocker switch. The switch function differs depending on machine state.
Position **1**: Off
Position **2**: Service venting (ignition switch on, engine off) or:
Position **2**: Aux venting (engine running)

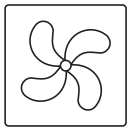
Refer to: Maintenance > Hydraulic System > General > Discharge (Page 234).

Hydraulic Tow Hitch



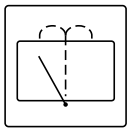
Three position rocker switch. The switch functions operate when the engine is running.
Position **1**: Raise tow hitch
Position **3**: Neutral
Position **2**: Lower tow hitch

Reverse Fan



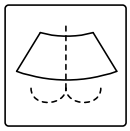
Three position rocker switch. The switch functions operate when the engine is running. An ECU Controls the fan speed and direction.
Position **1**: Off
Position **3**: Auto - With Auto selected, every 15 minutes the machine will automatically reduce the fan speed, change the direction and then increase the fan speed to maximum for 10 seconds. The machine will then reduce the fan speed, change back to the correct direction and then return to the optimum fan speed required to cool the machine.
Position **2**: Manual (spring-loaded) - A buzzer will sound while you reverse the fan manually, the dash should be displayed notifications on the main display. With Manual selected (press and hold) the machine will automatically reduce the fan speed, change the direction and then increase the fan speed. The fan will stay reversed until the switch is released, then the machine will reduce the fan speed, change back to the correct direction and then return to the optimum fan speed required to cool the machine. When you release the switch from manual mode the fan will then be in auto mode. You will have to move the switch to position 1 to ensure the fan does not auto reverse.

Rear Window Wiper



Three position rocker switch. The switch functions operate when the ignition switch is in the on position. The wiper will self park when switched off.
Position **1**: Wiper off
Position **3**: Wiper on
Position **2**: Washer on (push and hold)

Roof Window Wiper

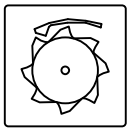


Three position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Wiper off
Position **3**: Wiper on
Position **2**: Washer on (push and hold)

Auxiliary Hydraulic Circuit

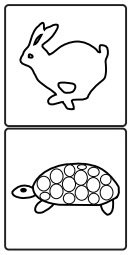
Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Rear auxiliary circuit
Position **2**: Front auxiliary circuit

Constant Flow



Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: Off
Position **2**: On

Two Speed Range



Two position rocker switch. The switch functions operate when the ignition switch is in the on position.
Position **1**: High-speed range engaged
Position **2**: Low-speed range engaged

Interior Switches

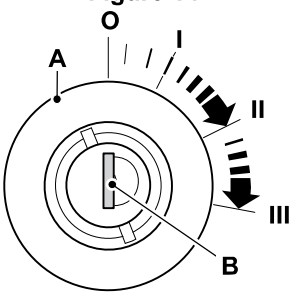
Ignition Switch

The ignition key operates the four-position ignition switch. The ignition key can only be inserted or removed in position 0.

If the engine fails to start, the ignition key must be returned to position 0 before the starter motor is re-engaged.

Do not operate the starter motor for more than 20s without the engine firing. If the engine fires but does not fully start, let the starter motor cool for at least 2min between starts.

Figure 14.



A Ignition switch **B** Ignition key

Table 9. Switch Positions

Position	Function
0	Off/Stop the Engine: Turn the ignition key to this position to stop the engine. Make sure the controls are in neutral and the boom is lowered before you stop the engine.
I	On: Turn the ignition key to this position to connect the battery to all of the electrical circuits. The ignition key will return to this position when it is released from position II or position III.
II	This position is not used .
III	Start: Turn the ignition key to this position to operate the starter motor and turn the engine. The ignition switch has an inhibitor to stop the ignition switch being turned ON when the engine is running.

Multi-Purpose Switch

Direction Indicators

Push the stalk forwards to indicate a left turn. Pull the stalk backwards to indicate a right turn. Place in central position to cancel.

Windscreen Wiper

Rotate the switch barrel to activate and cancel the windscreen wipers. The wiper speed can vary dependant on machine specification.

Single Speed (Standard)

0 = Off

I = On

Two Speed (Optional)

J = Intermittent Wipe

0 = Off

I = Slow

II = Fast

Windscreen Washer

Push the button to activate the windscreen washer. Allow the stalk to spring back to central position when finished.

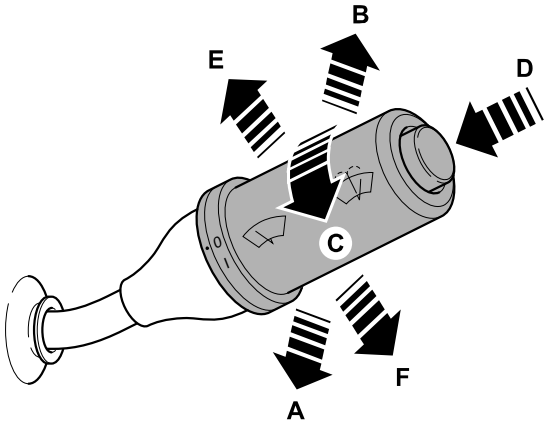
Headlights Flash

Lift the stalk upwards to flash the headlights. Allow the stalk to spring back to central position when finished.

Main Beam

When the road lights are switched on via main switch on console, push the stalk downwards to turn on the main beam. Pull the stalk upwards to the central position to turn off main beam. Switch off main beam for oncoming vehicles.

Figure 15.



A Backwards - Right turn
B Forwards - Left Turn
C Rotate - Wiper on and off or intermittent
D Push - Washer on
E Upwards - Headlights flash
F Downwards - Main beam

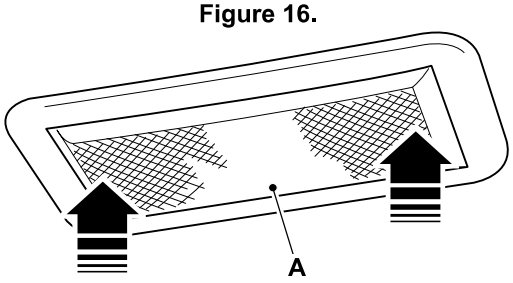
Cab Interior Light

Press either end of the light unit to turn on the cab interior light.

Press the other end of the light unit to turn off the cab interior light.

Make sure the cab interior light is turned off when you intend to leave the machine for a long period of time.

Figure 16.



A Cab interior light

Notes:

Operation
Introduction

General

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

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

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

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

Remember:

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

Operating Safety

General

Training

Make sure that you have had adequate training and that you are confident in your ability to operate the machine safely before you use it. Practice using the machine and its attachments until you are completely familiar with the controls and what they do. With a careful, well trained and experienced operator, your machine is a safe and efficient machine. With an inexperienced or careless operator, it can be dangerous. Do not put your life, or the lives of others, at risk by using the machine irresponsibly. Before you start to work, tell your colleagues what you will be doing and where you will be working. On a busy site, use a signalman.

Before doing any job not covered in this manual, find out the correct procedure. Your local JCB distributor will be glad to advise you.

Fuel

Fuel is flammable, keep naked flames away from the fuel system. Stop the engine immediately if a fuel leak is suspected. Do not smoke while refuelling or working on the fuel system. Do not refuel with the engine running. Completely wipe off any spilt fuel which could cause a fire. There could be a fire and injury if you do not follow these precautions.

Machine Condition

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

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.

Engine/Steering Failure

If the engine or steering fails, stop the machine as quickly as possible. Do not operate the machine until the fault has been corrected.

Exhaust Gases

Machine exhaust gases can harm and possibly kill you or bystanders if they are inhaled. Do not operate the machine in closed spaces without making sure there is good ventilation. If possible, install an exhaust extractor. If you begin to feel drowsy, stop the machine at once and get into fresh air.

Worksites

Worksites can be hazardous. Examine the site before working on it. 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. 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 structures.

Communications

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure any hand signals that may be used are understood by everybody. Worksites can be noisy, do not rely on spoken commands.

Parking

An incorrectly parked machine can move without an operator. Follow the instructions in the Operator's Manual to park the machine correctly.

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.

Safety Barriers

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

Sparks

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

Hazardous Atmospheres

This machine is designed for use in normal out door atmospheric conditions. It must not be used in an enclosed area without adequate ventilation. Do not use the machine in a potentially explosive atmosphere, i.e. combustible vapours, gas or dust, without first consulting your JCB dealer.

Regulations

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

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.

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

There is a minimum clearance required for working beneath overhead power cables. You must obtain details from your local electricity supplier.

Working Platform

Using the machine as a working platform is hazardous. You can fall off and be killed or injured. Never use the machine as a working platform unless with approved man-basket or man-crate (if applicable).

Machine Safety

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

Hot Components

Touching hot surfaces can burn skin. The engine and machine components will be hot after the unit has been running. Allow the engine and components to cool before servicing the unit.

Travelling at High Speeds

Travelling at high speeds can cause accidents. Always travel at a safe speed to suit working conditions.

Hillsides

Operating the machine on hillsides can be dangerous if the correct precautions are not taken. Ground conditions can be changed by rain, snow, ice etc. Check the site carefully. When applicable, keep all attachments low to the ground.

Visibility

Accidents can be caused by working in poor visibility. Use your lights to improve visibility. Keep the road lights, windows and mirrors clean.

Do not operate the machine if you cannot see clearly.

Modification of the machine's configuration by the user (e.g. the fitting of large and non-approved attachments) may result in a restriction of the machine visibility.

Hands and Feet

Keep your hands and feet inside the machine.

When using the machine, keep your hands and feet clear of moving parts. Keep your hands and feet within the operator compartment while the vehicle is in motion.

Controls

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

Passengers

Passengers in or on the machine can cause accidents. Do not carry passengers.

Fires

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the correct machine location until you need to use it.

Do not use water to put out a machine fire, you could spread an oil fire or get a shock from an electrical fire. Use carbon dioxide, dry chemical or foam extinguishers. Contact your nearest fire department as quickly as possible. Firefighters must use self-contained breathing apparatus.

Roll Over Protection

If the machine starts to roll over, you can be crushed if you try to leave the cab. If the machine starts to roll over, do not try and jump from the cab. Stay in the cab, with your seat belt fastened.

Confined Areas

Pay extra attention to proximity hazards when operating in confined areas. Proximity hazards include buildings, traffic and bystanders.

Safe Working Loads

Overloading the machine can damage it and make it unstable. Study the specifications in the Operator's Manual before using the machine.

Lightning

If you are inside the machine during a lightning storm stay in the machine until the storm has passed. If you are outside of the machine during a lightning storm stay away from the machine until the storm has passed. Do not attempt to mount or enter the machine.

If the machine is struck by lightning do not use the machine until it has been checked for damage and malfunction by trained personnel.

Worksite Safety

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

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

WARNING Before you start using the machine, check with your local gas company if there are any buried gas pipes on the site.

If there are buried gas pipes we recommend that you ask the gas company for any specific advice regarding the way you must work on the site.

Some modern gas pipes cannot be detected by metal detectors, so it is essential that an accurate map of buried gas pipes is obtained before any excavation work commences.

Hand dig trial holes to obtain precise pipe locations. Any cast iron pipes found must be assumed to be gas pipes until contrary evidence is obtained.

Older gas pipes can be damaged by heavy vehicles driving over the ground above them.

Leaking gas is highly explosive.

If a gas leak is suspected, contact the local gas company immediately and warn all personnel on the site. Ban smoking, make sure 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.

CAUTION Before you start using the machine, check with your local public water supplier 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 pipes and drains.

CAUTION If you cut through a fibre optic cable, Do not look into the end of it, your eyes could be permanently damaged.

An applicable worksite organisation is required in order to minimise hazards that are caused by restricted visibility. The worksite organisation is a collection of rules and procedures that coordinates the machines and people that work together in the same area. Examples of worksite organisation include:

- Restricted areas
- Controlled patterns of machine movement
- A system of communication.

You and/or your company could be legally liable for any damage you may cause to public utilities. It is your responsibility to make sure that you know the locations of any public utility cables or pipes on the worksite which could be damaged by your machine.

Risk Assessment

It is the responsibility of the competent people that plan the work and operate the machine to make a judgement about the safe use of the machine, they must take into account the specific application and conditions of use at the time.

It is essential that a risk assessment of the work to be done is completed and that the operator obeys any safety precautions that the assessment identifies.

If you are unsure of the suitability of the machine for a specific task, contact your JCB dealer who will be pleased to advise you.

The following considerations are intended as suggestions of some of the factors to be taken into account when a risk assessment is made. Other factors may need to be considered.

A good risk assessment depends on the training and experience of the operator. Do not put your life or the lives of others at risk.

Personnel

- Are all persons who will take part in the operation sufficiently trained, experienced and competent? Are they fit and sufficiently rested? A sick or tired operator is a dangerous operator.
- Is supervision needed? Is the supervisor sufficiently trained and experienced?
- As well as the machine operator, are any assistants or lookouts needed?

The Machine

- Is it in good working order?
- Have any reported defects been corrected?
- Have the daily checks been carried out?
- Are the tyres still at the correct pressure and in good condition and is there sufficient fuel to complete the job (if applicable)?

The Load

- How heavy is it? Is it within the capabilities of the machine?
- How bulky is it? The greater the surface area, the more affected it will be by wind speeds.
- Is it an awkward shape? How is the weight distributed? Uneven loads are more difficult to handle.
- Is there a possibility of the load shifting while being moved?

Loading/Unloading Area

- Is it level? Any slope of more than 2.5% (1 in 40) must be carefully considered.

- Is more than one direction of approach to the load possible? Approaching across the slope must be avoided, if possible.
- Is the ground solid? Will it support the weight of the machine when loaded?
- How rough is the ground? Are there any sharp projections which could cause damage, particularly to the tyres?
- Are there any obstacles or hazards in the area, for example, debris, excavations, manhole covers, power lines?
- Is the space sufficient for safe manoeuvring?
- Are any other machines or persons likely to be in or to enter the area while operations are in progress?

The Route to be Travelled

- How solid is the ground, will it provide sufficient traction and braking? Soft ground will affect the stability of the machine and this must be taken into account.
- How steep are any slopes, up/down/across? A cross slope is particularly hazardous, is it possible to detour to avoid them?

Weather

- How windy is it? High wind will adversely affect the stability of a loaded machine, particularly if the load is bulky.
- Is it raining or is rain likely? The ground that was solid and smooth when dry will become uneven and slippery when wet, and it will not give the same conditions for traction, steering or braking.

Walk-Around Inspection

General

⚠ **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. Also make sure that the park brake is engaged before doing these checks.

The following checks must 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.

1. Check for cleanliness.
   1.1. Clean the windows, light lenses and the rear view mirrors (where applicable).
   1.2. Remove dirt and debris, especially from around the linkages, rams, pivot points and radiator.
   1.3. Make sure the cab step and handrails are clean and dry.
   1.4. Clean all of the safety and instructional labels. Replace any label that is missing or cannot be read.
2. Check for damage.
   2.1. Examine the machine generally for damaged and missing parts.
   2.2. Make sure that the attachment is correctly attached and in good condition.
   2.3. Make sure that all of the pivot pins are correctly installed.
   2.4. Examine the windows for cracks and damage. Glass splinters can blind.
   2.5. Check for oil, fuel and coolant leakages below the machine.

   WARNING! *You could be killed or injured if a machine tyre bursts. Do not use the machine with damaged, incorrectly inflated or excessively worn tyres.*
3. Check the tyres.
   Refer to: Maintenance > Tyres (Page 232).
4. Make sure that all of the filler caps are installed correctly.
5. Make sure that all of the access panels are closed correctly.
   Refer to: Maintenance > Access Apertures (Page 207).
6. If the filler caps and access panels are installed with locks, we recommend that you lock them to prevent theft or tampering.

Entering and Leaving the Operator Station

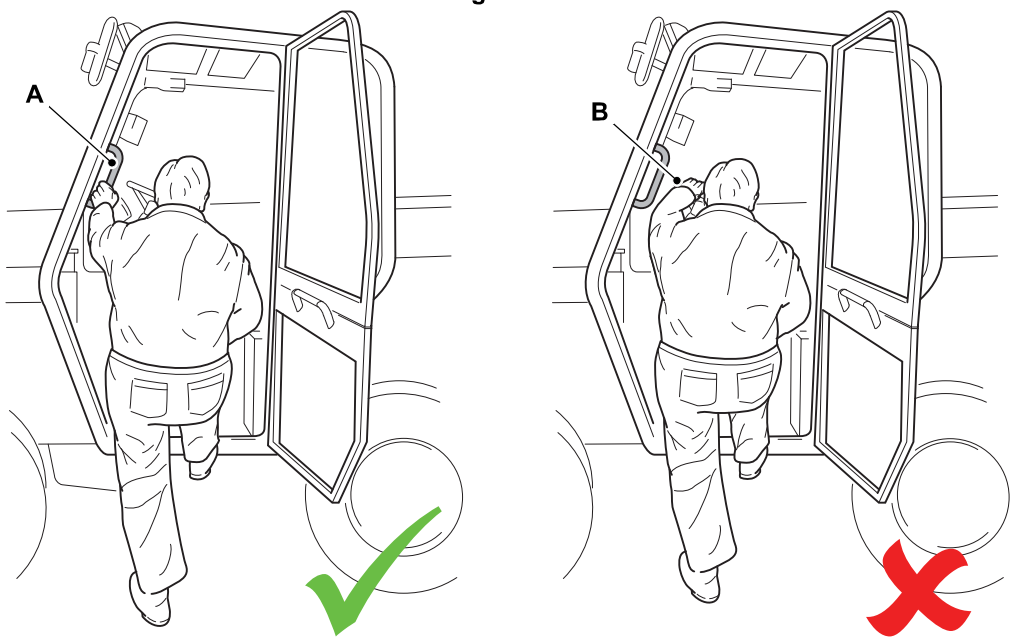
General

⚠ **CAUTION** Entering or leaving the operator station must only be made where the handrail provided. Always face the machine when entering and leaving. Make sure the handrail and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls as handholds, use the handrail.

Make sure the machine is stopped and correctly parked before entering or leaving the cab. Refer to: Operation > Stopping and Parking > General (Page 55).

When you get 'on' and 'off' the machine always maintain a point contact with the handrail. Do not use the machine controls as handholds.

Figure 17.



A Handrail

B Steering wheel

Emergency Exit

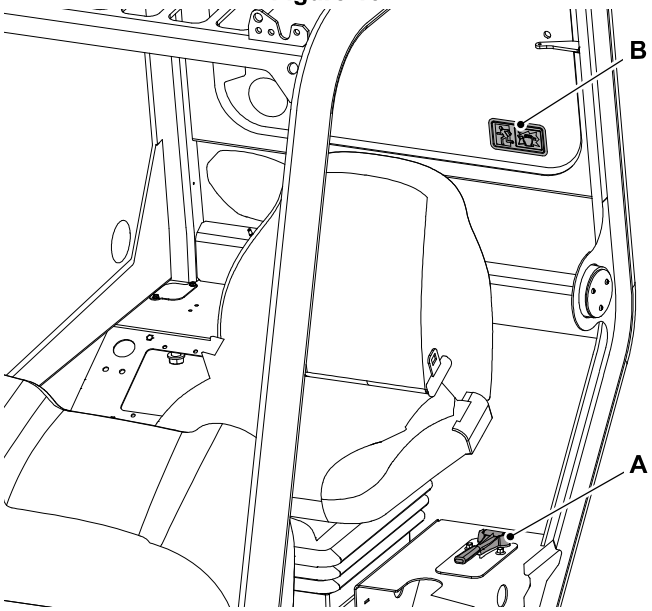
⚠ **WARNING** Do not obstruct the rear cab window, this is an emergency exit.

If the machine is installed with a glazing breaker, in an emergency use the glazing breaker to break the glass. Use the rear cab window as an emergency exit.

In the event of an emergency:

1. Remove the glazing breaker from it's stowage position.
2. Strike the rear cab window near the corner. This will shatter the screen, which can then be knocked out.

Figure 18.



A Glazing breaker

B Label

Doors

Operator Door

Door

To open the door from the outside:

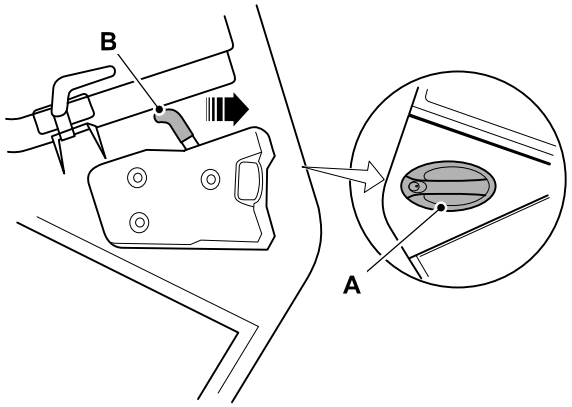
1. Unlock the door with the ignition key.
2. Pull the handle to release the latch.

To close the door:

Close the door from the inside by pulling the closing bar firmly; it will latch itself.

To open the door from the inside, pull lever to release the latch.

Figure 19.



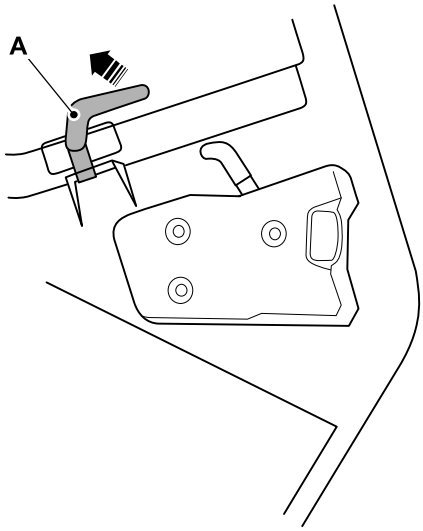
A Handle **B** Lever

Upper Door Section

To open the upper door section:

1. With the cab door closed, release the upper section by pulling lever to the rear.
2. Swing the door fully open until it latches.
3. Do not drive the machine with the upper door section unlatched.

Figure 20.

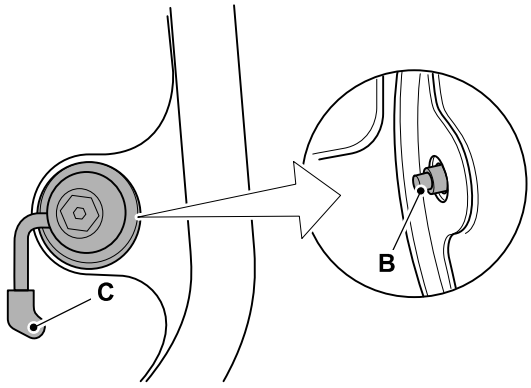


A Lever

To close the upper door section:

1. Press the button (if inside the cab) or release the catch (if outside the cab).
2. Swing the door closed.
3. Push the lever forward down to latch the upper door on to the lower door.

Figure 21.



B Button

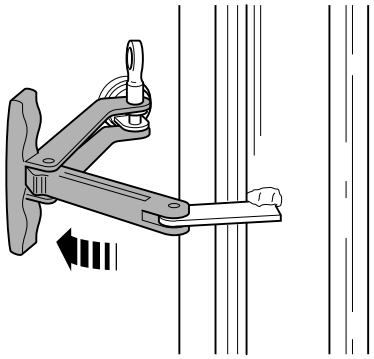
C Catch

Windows

Rear Window

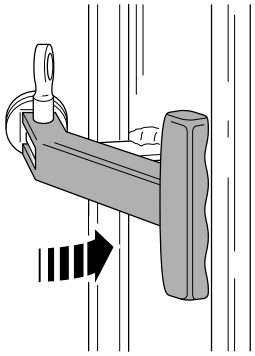
To open the window, swing the catch in the direction shown, as far as required.

Figure 22.



To close the window, swing the catch in the direction shown until it locks in position.

Figure 23.



Before Starting the Engine

General

⚠ **DANGER** 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.

WARNING Secure all loose articles. 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 could lose control of the machine.

CAUTION Machines installed with hose burst protection valves cannot have their attachments lowered with the engine stopped. Start the engine and lower the attachments before doing the walk-around inspection.

1. The park brake should have been engaged when the machine was last parked. If it is not already engaged, engage it now.
2. Read the Operating in Low Temperatures or Operating in High Temperatures procedures in the Operation section if you will be using the machine in very cold or very hot climates.

   Refer to: Operation > Operating Environment (Page 127).
3. If the fuel tank was empty or if any part of the fuel system has been drained or disconnected, the fuel system must be primed before you try to start the engine.
4. Lower the attachment to the ground
5. For your own safety (and others) and for the maximum service life of your machine, do a pre-start inspection before you start the engine.

   5.1. If you have not done it, do a walk-around inspection of the outside of the machine.

   Refer to: Operation > Walk-Around Inspection (Page 35).

   5.2. Remove any dirt and rubbish from the cab interior, specially around the pedals and control levers.

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

   5.4. Make sure that your hands and shoes are clean and dry.

   5.5. Remove or stow all loose articles in the cab, for example tools.

   5.6. Examine the ROPS (Roll-Over Protective Structure) and/or FOPS (Falling Object Protective Structure) for damage. Get your JCB dealer to repair any damage. Make sure all its securing bolts are installed and correctly tightened.

   5.7. Check around the cab for loose or missing bolts, screws etc. Replace or tighten where necessary.

   5.8. Examine the seat belt and its mountings for damage and excessive wear.

   Refer to: Maintenance > Operator Station > Seat Belt (Page 214).

   5.9. Make sure that the following operate correctly: lights, horn, all switches, front window washer and wipers (if installed).
6. Adjust the seat so that you can comfortably reach all the driving controls. You must be able to operate the control pedal with your back against the seat back. Make sure the seat locking lever has fully engaged.

   Refer to: Operation > Operator Seat (Page 42).
7. Adjust the rear view mirrors (where applicable) to give you a good view close behind the machine, when you are correctly seated.
8. Fasten the seat belt.

Operator Seat

General

⚠ **CAUTION** Position the seat so that you can comfortably reach the machine controls. Do not adjust the seat while the machine is moving. You could have an accident if you operate the machine with the seat in the wrong position.

The operator's seat can be adjusted for your comfort. A correctly adjusted seat will lower the operator fatigue.

Adjust the seat so that you can comfortably reach the machine controls.

For driving the machine, adjust the seat so that you can push the pedals fully down when your back is against the seat back.

Operator Present Switch

All seat options have been installed with an operator present switch. This switch ensures there is an operator present in the machine, and has the following effects:

- If there is no operator in the seat it is not possible to engage drive.
- If the operator leaves the seat, with the transmission engaged and the handbrake disengaged, then the machine will remain in drive, but an audible and visual warning will appear on the dash.
- If there is no operator in the seat then the hand throttle will not function.

Suspension Seat

Suspension Seat (KAB 100 Series - Mechanical)

Horizontal Adjustment

Lift the lever and slide the seat into the required position. Release the lever.

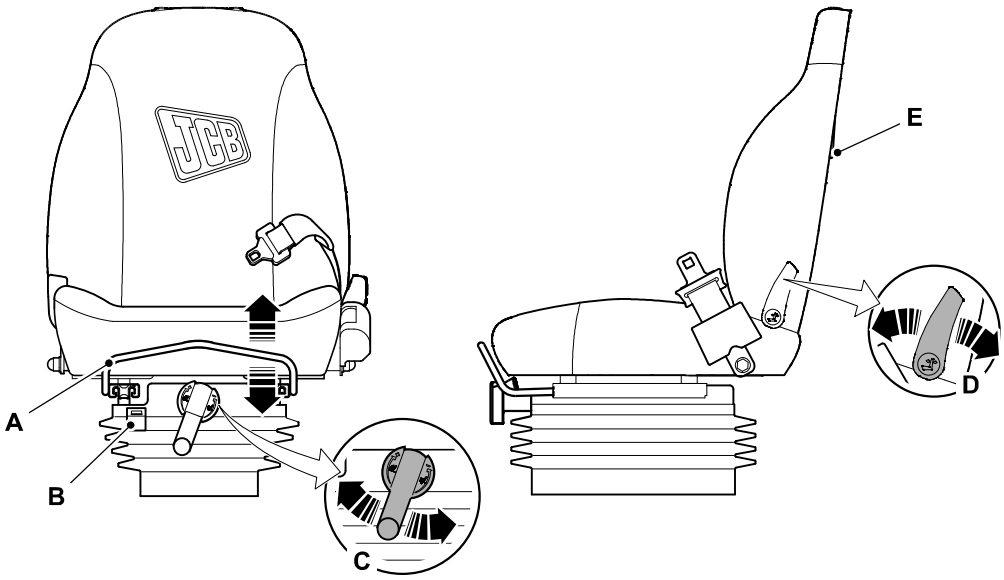
Height

Turn the adjuster lever until the ride height indicator is in the green 'comfort' zone.

Backrest

Lift the backrest lever and move the backrest to the required angle. Release the lever.

Figure 24.



A Horizontal adjustment lever
B Ride height indicator
C Height adjustment lever
D Backrest lever
E Document cover

Suspension Seat (KAB 100 Series - Air)

Horizontal Adjustment

Lift the lever and slide the seat into the required position. Release the lever.

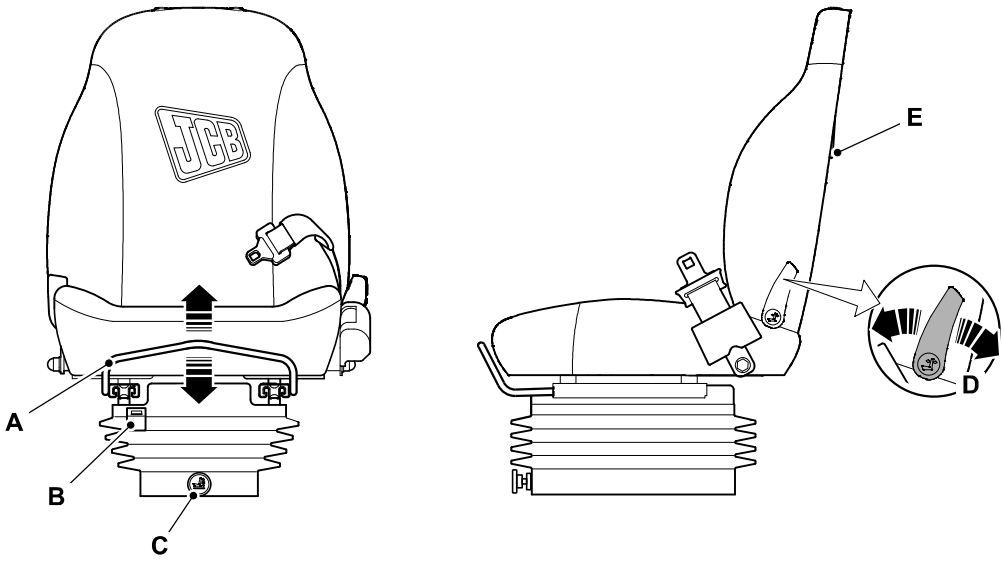
Height

Turn the adjuster lever until the ride height indicator is in the green 'comfort' zone.

Backrest

Lift the backrest lever and move the backrest to the required angle. Release the lever.

Figure 25.



A Horizontal adjustment lever
B Ride height indicator
C Height adjustment lever
D Backrest lever
E Document cover

Heated Seat Controls

The heated seat option is only available on the KAB 800 Series and Grammer Air Suspension Seats.

A manually operated switch is located on the rear of the backrest. Press heater switch to select on. Functions only with the ignition on.

The seat heater is thermostatically controlled and operates intermittently to achieve and maintain a predetermined temperature. No manual temperature adjustment is available.

Seat Belt

General

⚠ **WARNING** Operating the machine without a seat belt can be dangerous. Before starting the engine, make sure your seat belt is fastened. Check the tightness and condition of the seat belt securing bolts regularly.

WARNING When a seat belt is installed on 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.

Inertia Reel Seat Belt

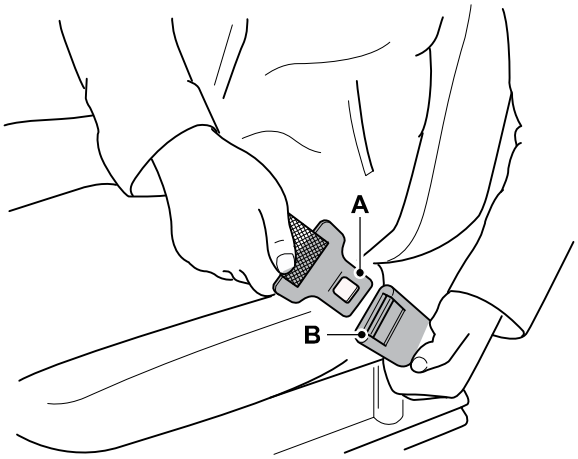
Fasten the Seat Belt

⚠ **WARNING** If you do not wear your seat belt you could be thrown about inside the machine, 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.

1. Sit correctly in the seat.
2. Pull the seat belt and the tongue from the inertia reel holder in one continuous movement.
3. Push the tongue into the latch. Make sure the seat belt worn is snug and properly located on the body. Make sure the seat belt is not twisted and that it is over your hips not your stomach.

   3.1. If the seat belt 'locks' before the tongue is engaged, let the seat belt retract into the inertia reel holder then try again. The inertia mechanism can lock if you pull the seat belt too quickly or if the machine is parked on an slope.

Figure 26.

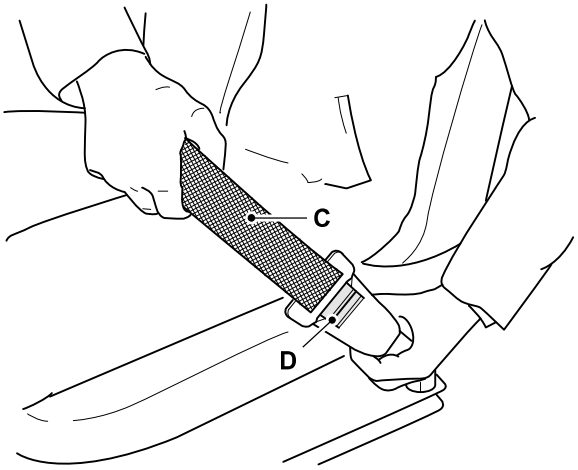


A Tongue **B** Latch

WARNING! *If the seat belt does not 'lock' when you check if the seat belt is operating correctly, do not drive the machine. Get the seat belt repaired or replaced immediately.*

4. To make sure the seat belt operates correctly, hold the middle of the seat belt and pull quickly. The seat belt should 'lock'. Refer to Figure 27.

Figure 27.



C Seat belt

D Button

Release the Seat Belt

⚠ **WARNING** Release the seat belt only after safely stopping the machine, switching off the engine and engaging the park brake (if applicable).

1. Push the button and pull the tongue from the latch.
2. Carefully let the seat belt retract into the inertia reel holder.

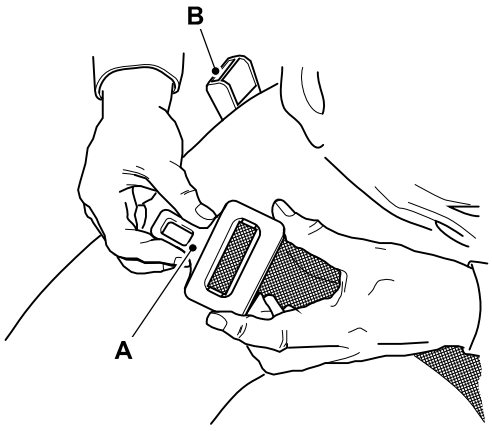
Static Seat Belt

Fasten the Seat Belt

⚠ **WARNING** If you do not wear your seat belt you could be thrown about inside the machine, 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.

1. Sit correctly in the seat.
2. Push the tongue into the latch. Make sure the seat belt is worn snug and properly located on the body. Make sure the seat belt is not twisted and that it is over your hips not your stomach.

Figure 28.

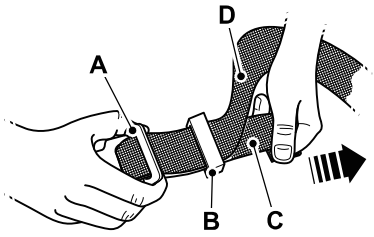


A Tongue
B Latch

Adjust

1. Move the toggle the required distance down the strap.
2. To make the strap longer, pull the end as far as it will go.
3. To make the strap shorter, pull the end as far as it will go.

Figure 29.



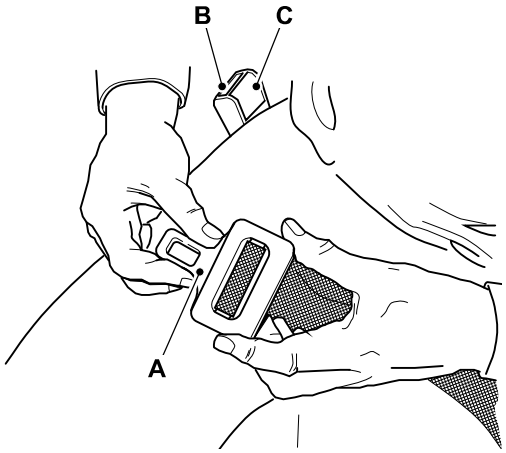
A Tongue
B Toggle
C Strap (pull here to lengthen)
D Strap (pull here to shorten)

Release the Seat Belt

⚠ **WARNING** Release the seat belt only after safely stopping the machine, switching off the engine and engaging the park brake (if applicable).

1. Push the button and pull the tongue from the latch.

Figure 30.



A Tongue
B Latch
C Button

Mirrors

General

The following information is provided so that the operator can minimise visibility hazards when operating the machine.

This machine meets the visibility requirements specified in FprEN 15830:2011. The machine has been subject to a static visibility assessment with a simulated load in two positions: the load on the forks 500 ± 50mm above the ground, and the load suspended 600mm beneath the forks while the forks are 2,200mm above the ground.

The test simulates operator visibility in establishing lines of sight between the operator's eyes and points on the ground at a 12m radius from the machine, and on a boundary line 1.5m above the ground and 1m away from the smallest rectangle that encompasses a plan view of the machine. Whilst based upon ergonomic data (binocular eye spacing, turning of the head and body torso movement), the standard sometimes purposefully restricts/removes movement which is ergonomically achievable in order to improve/maintain the current state of art. As a consequence, visibility diagrams in accordance with FprEN 15830:2011 often report visibility maskings which do not exist in practice.

Visibility diagrams according to FprEN 15830:2011 are provided. Refer to: Technical Data > Static Dimensions (Page 243).

When they operate the machine, the operator must continually survey their field of vision. It is important that the mirrors are securely installed and give maximum vision around the machine.

The machine should be used in accordance with appropriate jobsite organisation and persons should be kept outside of the immediate vicinity of the machine considering the working range of equipment/ attachment and speed of movement of the machine.

When a mirror is provided to supplement the operator's direct field of vision, it must be adjusted to give the field of view shown in order for it to serve as an aid to the operator in seeing people or obstacles around the machine. The mirror provides indirect vision to hidden areas and improves the effectiveness of the machines usage.

The visibility requirements of this machine has also been assessed in a lorry trailer loading condition as specified in FprEN 15830:2011. The machine has been subject to a static visibility assessment with the simulated load on the forks 1,000 ± 50mm above the ground.

Use of the machine with non-standard modifications, and/ or in non-standard configurations, and/or with attachments that result in restriction of the machine visibility should be assessed in accordance with FprEN 15830:2011 to determine if further devices and/or jobsite controls are required.

If a suspended load or the resulting geometry creates a substantial blockage to visibility, the operator should consider alternative means of carrying the load (e.g. palletised load).

Starting the Engine

General

⚠ **CAUTION** Do not use ether or other starting fluids to assist cold starting. Using these fluids may result in an explosion causing possible injury and/or damage to the engine.

1. Make sure that the machine is ready to start.

   Refer to: Operation > Before Starting the Engine (Page 41).

2. Put the forward/reverse lever in neutral.

   Refer to: Operation > Operating Levers/Pedals (Page 89).

   2.1. The engine will not start unless the forward/reverse lever is in neutral.

3. Make sure the battery isolator key is installed and switched on.

   Refer to: Operation > Battery Isolator > General (Page 118).

4. If the machine has an immobiliser then you must disarm the immobiliser before you can start the engine.

   Refer to: Operation > Starting the Engine > Immobiliser (Page 51).

5. Start the engine at normal engine start:

   5.1. Turn the ignition key to the start position (position III) and hold it there until the engine starts.

6. Start the engine at cold climate engine start:

   Temperature: -12–0°C (10.4–32.0°F)

   6.1. Turn the ignition key to the on position (position I), the cold start inlet manifold heater icon shows on the dash.

   Refer to: Operation > Instruments > Instrument Panel (Page 69).

   6.2. When the icon is extinguished, turn the ignition key to the start position (position III) and hold it there until the engine starts.

   6.3. There is an intentional delay of time specified prior to starting the engine to assist the priming of the engine lubrication system.

   Duration: 2s

   6.4. After you start the machine there is an intentional delay of time specified at idle during which time the throttle control is overridden to assist priming of the lubrication system.

   Duration: 14.5s

7. Start the engine at cold climate engine start: -20–-12°C (-4–10.4°F)

   7.1. When you start the machine at these ambient temperatures, a grid heater must be installed in to the inlet manifold of the engine.

   7.2. Turn the ignition key to the on position (position I), the cold start inlet manifold heater icon shows on the dash.

   Refer to: Operation > Instruments (Page 69).

   7.3. When the icon is extinguished, turn the ignition key to the start position (position III) and hold it there until the engine starts.

   7.4. There is an intentional delay of time specified prior to starting the engine to assist the priming of the engine lubrication system.

   Duration: 2s

   7.5. After you start the machine there is an intentional delay of time specified at idle during which time the throttle control is overridden to assist priming of the lubrication system.

   Duration: 26.5s

8. Start the engine at cold climate engine start: below

   Temperature: -20°C (-4.0°F)

   8.1. When you start the machine at these ambient temperatures, a grid heater must be installed in to the inlet manifold of the engine and block heaters must be installed in to the engine block coolant jacket.

   8.2. There is no detriment if the block heater is used in ambient temperatures of -20–-12°C (-4–10.4°F).

   8.3. Do not use the block heater in ambient temperatures of above the temperature specified.

   Temperature: 0°C (32.0°F)

   8.4. Regularly check the ambient temperature to determine if the block heater is necessary.

   8.5. Turn the ignition key to the on position (position I), the cold start inlet manifold heater icon shows on the dash.

   Refer to: Operation > Instruments (Page 69).

   8.6. When the icon is extinguished, turn the ignition key to the start position (position III) and hold it there until the engine starts.

   8.7. After you start the machine there is an intentional delay of time specified at idle during which time the throttle control is overridden to assist priming of the lubrication system.

   Duration: 34s

9. Do not operate the starter motor without the engine firing not more than the time specified.

   Duration: 15s

10. If the engine fires but does not fully start, do not operate the starter motor for more than the time specified.

    Duration: 45s

11. Before you try another start, let the starter motor cool down for at least the time specified.

    Duration: 60s

12. After engine start, the idle speed may be higher than normal in cold conditions, this is not a fault.

13. Release the ignition key when the engine starts.

    13.1. The ignition key will go back to the on position (position I).

14. When the engine has started, make sure that all the warning lights have gone off and that the audible alarm is silent.

    Refer to: Operation > Instruments > Instrument Panel (Page 69).

    14.1. Do not race the engine until the oil pressure low light has gone off.

    14.2. Racing the engine too soon could damage the turbo-charger due to under lubrication.

15. The engine noise and/or tone may be louder than usual when cold. This is normal and is due to the fuel injection pump being advanced. The engine will become quieter when the engine reaches normal operating temperature.

16. Machines which are installed with a vari-speed hydraulic cooling fan - the speed of the fan will vary according to operating conditions.

17. If any warning lights fail to go off, or come on while the engine is running, stop the engine as soon as it is safe to do so.

18. Operate the hydraulic services to make sure that each function is working correctly and to help warm up the hydraulic system.

    18.1. Do not operate the attachments until the hydraulic oil has reached its normal working temperature.

    18.2. The LLMC (Longitudinal Load Moment Control) system (if installed) requires the hydraulic oil temperature to be sufficiently warm for effective operation.

Refer to: Operation > Lifting and Loading > Load Motion Control System (Page 100).

New engines do not require a running-in period. The engine/machine should be used in a 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).

Immobiliser

(if installed)

There are two different JCB immobiliser systems, one uses a keypad and the other a unique key system.

If your machine has an immobiliser system installed, then your JCB dealer should enable the system as part of the standard machine Installation. If you prefer that the system is not enabled, then you must tell your JCB dealer. Your JCB dealer can enable the system at a later date. Machines with immobilisers installed should always be parked as per the instructions in the operators manual.

Introduction

Before attempting to disarm the immobiliser check that the machine is ready to start and that you have your four digit PIN (Product Identification Number) code available.

The green LED (Light Emitting Diode) will illuminate every time that a keypad button is fully depressed. Do not operate buttons with sharp objects, they may damage and disable the keypad.

If you make an error entering your PIN code and you realise this before pressing the ENT button then pressing the MD button cancels inputs and allows you to re-commence.

If the PIN code is incorrectly entered five times the immobiliser will lock for 15min. In this event it is recommended that you contact the machine owner for confirmation of the PIN code.

The PIN code will have to be entered every time that the ignition is switched off for longer than two minutes.

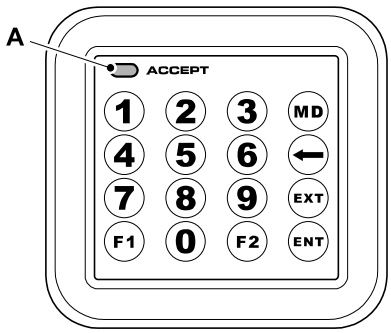
To Disarm the Immobiliser to Allow the Machine to be Used

1. Put the ignition key in the ignition switch. Turn the ignition key to position 1.
2. Enter your four digit PIN code using the keypad.
3. Push the 'ENT' button. The LED will come on for three seconds if the PIN code is correct and the machine can be started.
4. If an incorrect PIN code is entered the unit will lock. The LED will flash twice quickly, pause and then flash twice again and will continue this pattern until the ignition key is turned to the off position. In this event return to step 1 to try again.

   4.1. After five failed tries the system will lock.

   Duration: 15min

Figure 31.



A LED

To Arm the Immobiliser

1. Stop the engine. Remove the ignition key.
2. The immobiliser arms automatically after two minutes. The green LED flashes for 60 seconds, then goes off.
3. If you restart the engine within two minutes, the system disarms automatically.

To Add a New or Additional PIN Code

Before you try to add a new or additional PIN code, make sure that the machine is ready to start and that you have your six digit master code and your new four digit PIN code available.

If you are unsure of the master code or your new PIN code, then do not start this procedure.

The keypad immobiliser can be programmed to accept up to 14 different four digit PIN codes, any of which will let the machine be started.

1. Put the ignition key in the ignition switch. Turn the ignition key to position 1
2. Enter your six digit master code using the keypad. Push the 'ENT' button.
3. The LED will flash three times to indicate the acceptance of the master code.
4. Within 59 seconds of the three flashes, push the 'MD' button.
5. Enter your new four digit PIN code using the keypad. Push the 'ENT' button. The LED will flash four times to indicate that the new PIN code has been successfully entered.
6. Turn the ignition key to the off position, then a minimum of five seconds later, turn the ignition key to position 1. The new PIN code is now entered and recorded.
7. If another PIN code is to be entered, turn the ignition key to the off position, then return to step 1.

To Delete all of the PIN Codes

Deleting all the PIN codes does not allow the immobiliser to be bypassed. A four digit PIN code must be entered before the machine can be started.

If you are unsure of the master PIN code or your new PIN code, then do not start this procedure.

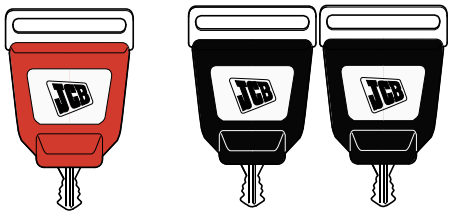
1. Put the ignition key in the ignition switch. Turn the ignition key to position 1.
2. Enter your six digit master PIN code using the keypad. Push the 'ENT' button. The LED will flash three times to indicate the acceptance of the code.
3. Push the buttons in the following sequence, 'MD', 'F1', 'ENT'. The LED will flash five times to indicate the acceptance of the delete command.

Unique Key Immobiliser System

Introduction

Each machine is supplied with a master key (red) and two ignition keys (black). The master key is used by the operator to program the ignition keys. You must use an ignition key to start or operate the machine.

Figure 32.



To Disarm the Immobiliser

1. Put the ignition key in the ignition switch.
2. Start the engine.

Figure 33.

A LED (The position may vary).

To Arm the Immobiliser

1. Stop the engine. Remove the ignition key.
2. The immobiliser immediately arms automatically.

To Add a New or Additional Ignition Key

The ignition keys can be programmed to start more than one machine.

1. Put the master key in the ignition switch.
2. Turn the master key to position 1. The LED will flash three times.
3. Turn the master key to position 0. Remove the master key.
4. Put a new or an additional ignition key in the ignition switch. Turn the ignition key to position 1. The LED will flash four times.
5. The new key has been added.

To Remove the Program From an Ignition Keys

The ignition keys can still be used on any other machine on which they have been programmed.

1. Put the master key in the ignition switch.

2. Turn the master key to position 1. The LED will flash three times.
3. Keep the master key in position 1 for 60 seconds. The ignition keys codes have now been deleted from the ECU (Electronic Control Unit).
4. Turn the master key to position 0. Remove the master key.
5. Add the required black keys in the system.

The starter keys will still be able to be used on any other machine on which they have been programmed.

If a non-programmed key or standard key is used, then a symbol will appear on the LCD (Liquid Crystal Display) screen, and the machine will not start.

Stopping and Parking

General

⚠ **DANGER** 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.

WARNING You or others can be killed or injured if you suddenly change from forward to reverse, or vice versa, when travelling. The machine will immediately reverse direction without warning to others. Always follow the recommended procedure for changing between forward and reverse drive.

WARNING Do not dismount a moving machine.

CAUTION Entering or leaving the operator station must only be made where steps and handrails are provided. Always face the machine when entering and leaving. 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.

Notice: The park brake must not be used to slow the machine from travelling speed, except in an emergency, otherwise the efficiency of the brake will be reduced.

1. Stop the machine on dry and level ground where the machine will not be a hazard or danger.
2. Ease up on the accelerator pedal and down on the brake pedal to bring the machine to a smooth stop. Keep the foot brake on until the park brake has been applied and the drive disengaged.
3. Activate the park brake.
4. Set the transmission to neutral. Make sure the lever is in its detent position. Make sure that the park brake indicator light is extinguished.
5. Retract and lower the boom, rest the forks flat on the ground.
6. Lock the controls.

   Refer to: Operation > Safety Equipment > Control Lock (Page 61).
7. It is recommended that turbocharged engines are run at 1000 RPM (approximately) and reduced load for a short of time before shut down to let the turbocharger to cool.

   Duration: 2–3min
8. If you are leaving the machine, make sure that all switches are set to off. If necessary, leave the hazard warning and/or side lights switched on. Remove the ignition key.
9. Use the handholds and step when you climb down from the machine. If you are leaving the machine, close and latch all windows and lock both doors. Make sure that the filler cap is locked on.
10. At the end of a working cycle or if the machine is being left unattended, provided the lights are not required remove the battery isolator key (if installed).

    Refer to: Maintenance > Electrical System > Battery Isolator (Page 238).

Preparing for Travel

General

When you travel on the road or on site there are usually local rules and safety regulations for the machine travel position.

This publication contains recommendations that may help you meet the requirements of these regulations, they are not necessarily the applied law.

If your machine is installed with a travel height label make sure you adhere to it.

Make sure that before you travel on public roads or site, you and your machine comply with all the relevant local laws - it is your responsibility.

UK Road Travel

In the U.K. before you travel on the public roads, it is your responsibility as a user to comply with The Road Vehicles (Construction and Use) (Amendment) Regulations 1997 (Bridge Bashing Regs.). By way of guidance only, follow the steps to take the vehicle on road:

Always assess your route for overhead structures such as bridges which could be damaged by your machine.

Use a restraint device to tie the bucket to the lower structure.

This information is believed to be correct, JCB cannot be aware of all circumstances in which JCB machines may be operated on a public highway and it is the responsibility of the user to make sure the compliance with the regulations.

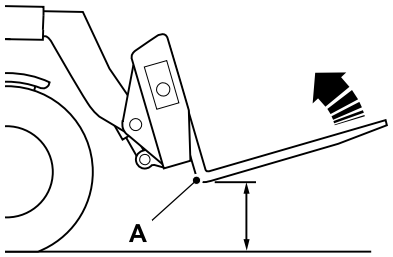
Other Territories Road Travel

This publication does not contain the rules and laws of the areas that the machine will be travelling. Contact your local authorities before you travel on public roads.

Preparing for Road Travel

1. Before you travel on public roads, remove the front windscreen guard if installed.
2. Fully retract the boom.
3. Lower the boom fully then raise it slightly.
4. Tilt the carriage back, to keep the heel of the forks to the specified length to above the ground.
   Length/Dimension/Distance: 300mm

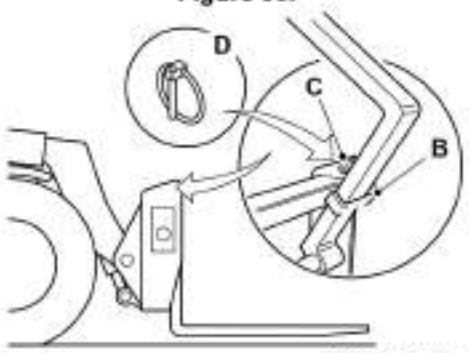
Figure 34.



A Fork

5. Install the fork retention brackets (as required) and secure with the retaining pin and locking pin.

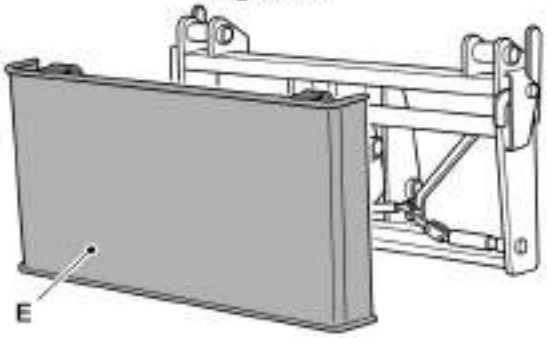
Figure 35.



B Retention brackets
C Retaining pin
D Locking pin

6. In certain countries, legislation requires forks to be removed and safety guard installed.

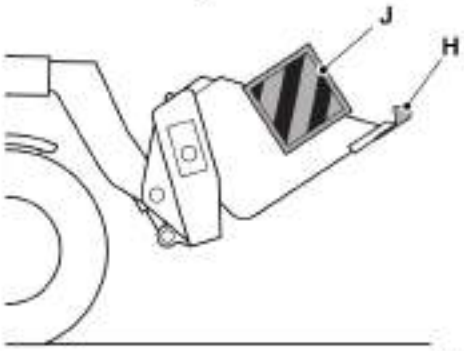
Figure 36.



E Safety guard

7. If any optional attachments are installed, make them safe.
   Refer to: Attachments (Page 131).
   7.1. Install the tooth guard if you travel the machine with bucket.
   7.2. In certain countries, legislation requires safety marker plate to be installed before you travel on the public roads.

Figure 37.



H Tooth guard
J Marker plate

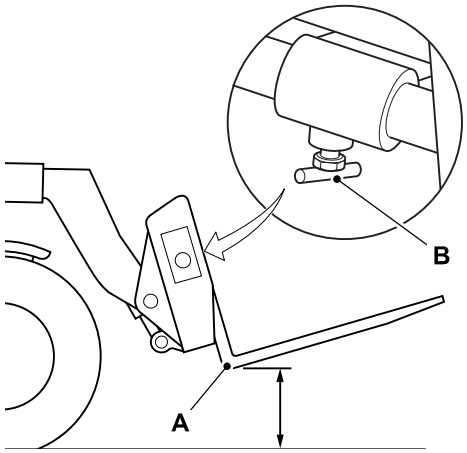
8. Do not travel on public roads with the machine loaded.

9. Lock the controls (as required).
10. Align the road wheels.
11. Select the 2-wheel drive.
12. Check that all road lights are working correctly.
13. The traffic regulations may require you to have a rotating beacon operating on some public roads.
    Refer to: Operation > Preparing for Travel > Beacon (Page 59).
14. Switch on the smooth ride system (if installed).
    Refer to: Operation > Preparing for Travel > Smooth Ride System (SRS) (Page 58).

Preparing for Worksite Travel

1. Fully retract the boom.
2. Lower the boom fully then raise it slightly.
3. Tilt the carriage back, to keep the heel of the forks above the ground.
   Length/Dimension/Distance: 300mm

Figure 38.



A Fork **B** Clamping screws

4. Tighten the clamping screws to prevent side movement of the forks (if installed).
5. Select the steer mode required.
6. If any optional attachments are installed, make them safe.
   Refer to: Attachments (Page 131).
7. Switch on the smooth ride system (if installed).
   Refer to: Operation > Preparing for Travel > Smooth Ride System (SRS) (Page 58).

Smooth Ride System (SRS)

⚠ **WARNING** Do not attempt to use the boom to raise the front of the machine. With the Smooth Ride System activated, the machine will drop suddenly when the control lever returns to the neutral position. Switch off SRS before working on the machine.

The SRS (Smooth Ride System) will enhance machine operation by smoothing the ride across uneven surfaces.

It is intended for use when travelling, but will also enhance machine operation when used in loading and re-handling operations.

The boom will move up and down independently of the machine with SRS selected. Make sure there is adequate ground clearance below the boom and attachment to allow for this movement.

The boom must be fully lowered, or the weight supported on the ground, before the system will engage.

Activate the system:

1. Press and hold the switch fully down (position 2).
2. Operate the boom lower control, until SRS icon appears on the dash.
3. The SRS is now applied.

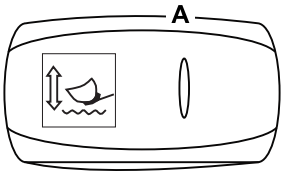
   3.1. If the SRS Icon does not appear, make sure the boom is fully lowered before repeating steps 1 and 2.
4. Release the boom lower control and the switch.

The SRS performance can be reduced if the carriage is fully crowded back, due to an interaction with the parallel lift ram.

Switch off the SRS before placing loads where greater precision is needed.

The SRS system will need to be re-selected every time the ignition key is switched off, or the power supply is interrupted.

Figure 39.



A Switch

Beacon

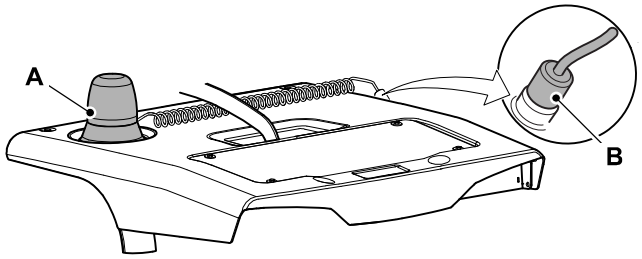
In certain territories you will break the law if you do not install a rotating beacon before you travel on site/public highways, make sure you comply with the local laws.

Be careful when you operate the machine with a beacon. The total height of the machine is increased when the beacon is in the operating position.

1. Put the beacon on the cab roof. A magnetic base keeps the beacon in position.
2. Put the plug into the cab roof socket.
3. Use the beacon switch in the cab to operate the beacon. The indicator light in the switch illuminates when the beacon is operating.

   Refer to: About the Product > Console Switches (Page 20).

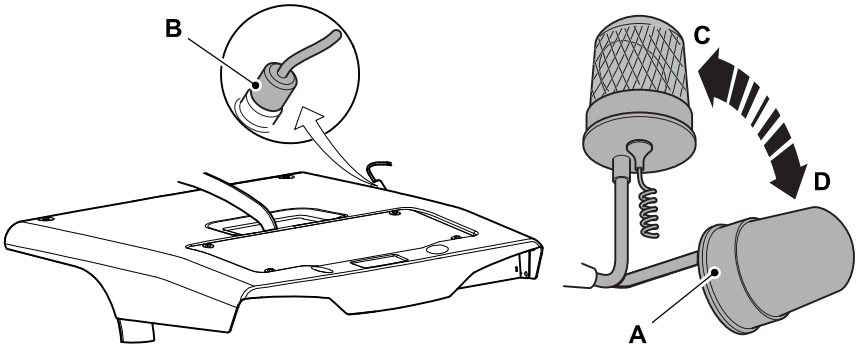
Figure 40. Magnetic Mount



A Beacon
B Plug

The beacon is permanently installed on the machine. When in use it must be raised in position. When not in use it must be lowered in position. Refer to Figure 41.

Figure 41. Hinged



A Beacon
B Plug
C Raised position
D Lowered position

Safety Equipment

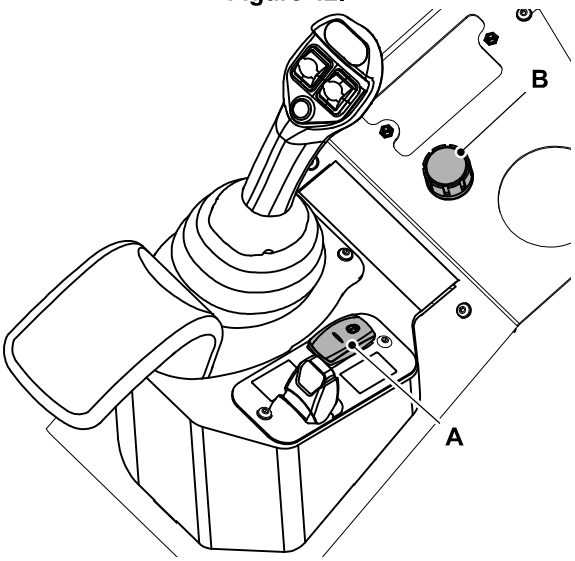
Control Lock

The requirement for control lever lock/isolation varies according to local legislation. You must comply with local legislation at all times.

The control locks/switches are designed to lock or isolate the control(s) in the neutral position.

You must lock the controls before you travel on public roads.

Figure 42.



A Control lock switch

B Machine hydraulic stop switch

All Lever Lock

Isolate the joystick functions before you travel on public roads.

To isolate the joystick functions, operate the joystick isolation switch to the on position. Refer to: About the Product > Console Switches (Page 20).

The joystick isolation switch isolates the joystick's electrical functions. If the switch fails to isolate the controls (i.e, because of sticking valve spool), press the machine hydraulic stop switch. Twist the knob in the direction of the arrows on the switch to release the stop switch. Do not release the switch until it is safe to do so.

Tilt Lever Lock

The tilt lever lock must be isolated when using a platform.

Operate the control lock switch to isolate the tilt lever function.

Drive Controls

Steering Wheel

Turn the steering wheel in the direction you want to go. Refer to: About the Product > Operator Station > Component Locations (Page 18).

The steering wheel incorporates an assister knob for single handed operation.

Steering Column

⚠ **CAUTION** Make sure the steering column is locked in position. Do not adjust the steering column while driving.

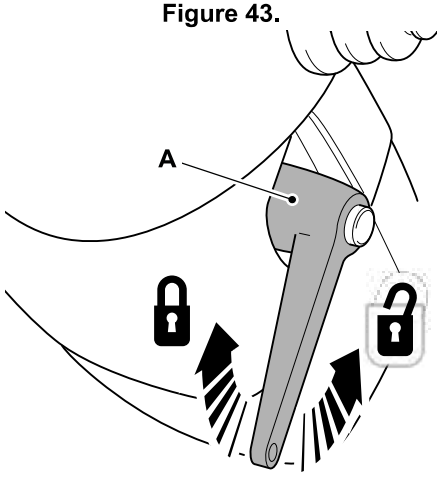
The steering column angle can be adjusted to suit the operator and to allow easier access for entering and leaving the cab.

To adjust the steering column:

1. Hold the steering wheel,complete turn the lever in a counter clockwise direction to unlock the steering column.
2. Adjust the steering column to the required position.
3. Turn the lever in a clockwise direction to lock the steering column.

To adjust the position of the lock lever, pull the lever and move to the required position.

Figure 43.



A Lever

Accelerator Pedal

The accelerator pedal is located on the floor of the cab, to the right of the steering column.

The travel speed is governed by depressing the accelerator pedal.

Release the pedal to decrease the travel speed. Refer to: About the Product > Operator Station > Component Locations (Page 18).

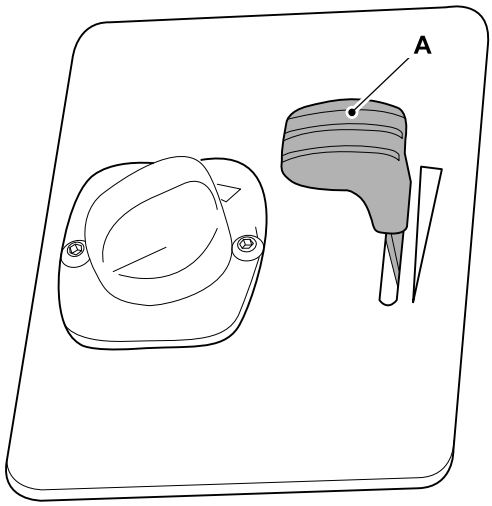
Hand Throttle Control

(If Installed)

⚠ **CAUTION** When driving the machine use the accelerator pedal to control the engine speed. Do not use the hand throttle lever to set the engine speed while driving.

Move the lever to increase or to decrease the engine speed.

Figure 44.



A Hand throttle lever

If the lever is not in the minimum position when the ignition switch is in the on position, the hand throttle control will not operate. Move the lever to the minimum position to restore hand throttle control.

Calibration

If the engine speed does not return to idle when the lever is set to the minimum position the hand throttle requires calibration.

1. Move the lever to the maximum setting.
2. Move back the lever to the minimum setting.

Travel Speed Selector

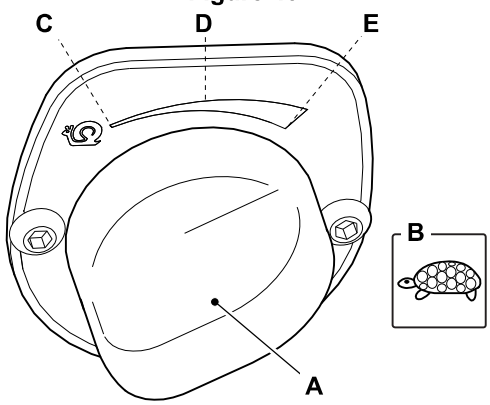
The travel speed will hold a road speed on a constant gradient. Machine speed will vary with changes in gradient.

The travel speed can be used when using a machine attachment that requires a high hydraulic flow and low transmission speed, such as a sweeper collector.

The warning light illuminates when the travel speed control knob is moved from the maximum position. The digital display indicates the position of the knob in % of maximum. Refer to Figure 45.

When the machine speed range switch is set to the low speed the dial on the travel speed represents 0–6km/h (0.0–3.7mph) for construction machines and 0–12km/h (0.0–7.5mph) for agricultural machines.

Figure 45.

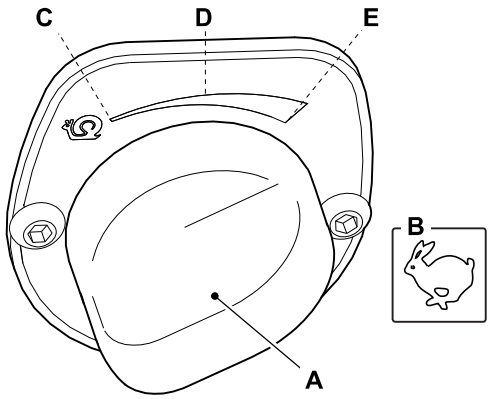


A Travel speed control knob
B Low speed
C 0% (0km/h (0.0mph))
D 50% (3km/h (1.9mph))
E 100% (6km/h (3.7mph))

The example shown is for 25km/h (15.5mph) machines only. For other machine variants the maximum speed of the machine is the maximum control knob setting. Refer to Figure 46.

When the machine speed range switch is set to the high speed the dial on the travel speed represents 0km/h (0.0mph) minimum machine speed and 25km/h (15.5mph) maximum machine speed.

Figure 46.



A Travel speed control knob
B High speed
C 0% (0km/h (0.0mph))
D 50% (12km/h (7.5mph))
E 100% (25km/h (15.5mph))

Service Brake Pedal

The brake pedal is located on the floor of the cab, to the left of the steering column.

Press the pedal to apply the brakes. The more the pedal is pressed, the sharper the braking action. Refer to: About the Product > Operator Station > Component Locations (Page 18).

Inching Pedal

The pedal is used to de-swash the transmission pump. As the pedal is pushed towards the floor the machine speed is reduced proportionally to desired pedal position. No Brake pedal inching is active on these machines.

No Inching Pedal

When the brake pedal is applied the transmission is disconnected from the axles to prevent the machine driving against the pressure of the brakes. This is useful in applications where high engine speed is required to be maintained the transmission does not drive through the brake.

Park Brake

⚠ **WARNING** Be careful, if the park brake is not functioning and the drive controls are in neutral the machine will roll down the slope. To stop the machine engage drive controls.

Notice: The park brake must not be used to slow the machine from travelling speed, except in an emergency, otherwise the efficiency of the brake will be reduced.

The park brake lever is located to the right of the operator seat by the joystick.

The transmission drive is automatically disconnected when the park brake is engaged.

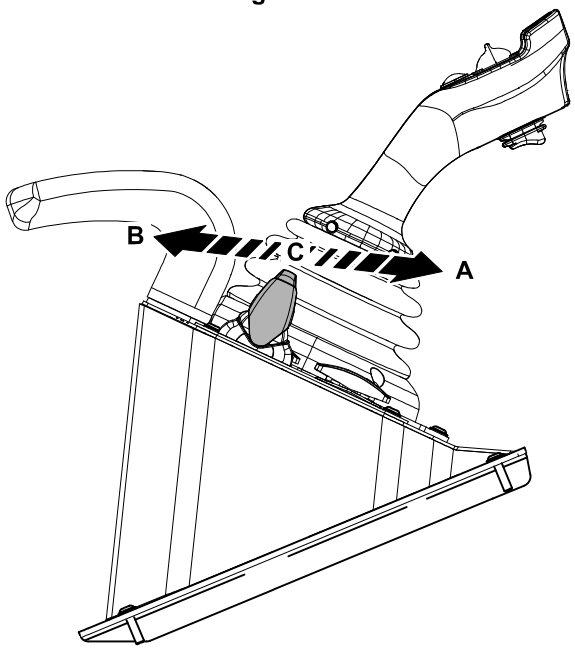
Pull the lever towards the operator to apply the park brake. The park brake indicator will come on.

The park brake indicator will come on when the forward/reverse is selected.

Push the lever away from the operator to release the park brake. The park brake indicator will goes off. Refer to: About the Product > Operator Station > Component Locations (Page 18).

if the park brake is partially applied, park brake indicator will come on. This will give operator the ability to modulate the park brake force in the event of emergency stop.

Figure 47.

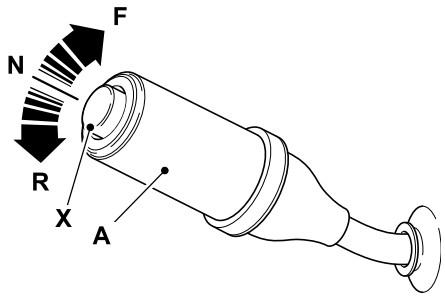


A Park brake off
B Park brake on
C Park brake partially on

Transmission Drive Lever

⚠ **WARNING** You and others can be injured if you operate the forward/reverse lever while you travel. The machine will immediately reverse direction without warning to others. Follow the recommended procedure for proper use of this selector.

Figure 48.



A Drive lever
N Neutral
X Horn
F Forward direction
R Reverse direction

A hand operated drive lever controls the direction of the machine.

The drive lever has three positions forward (F), reverse (R) and neutral (N). Move the lever up to select the forward direction, down to select the reverse direction.

To select neutral, position the drive lever between the forward and reverse positions. The engine will only start if the lever is at neutral position.

The lever has detent positions in forward, reverse and neutral. Pull the lever towards you to move the lever from the detent position. When reverse is selected an alarm will sound.

If the park brake is engaged when forward/reverse is selected, the park brake indicator will illuminate and the warning buzzer will sound.

Horn

The horn button is at the end of the forward/reverse lever. Push the button to operate the horn. It functions only with the starter switch set to on.

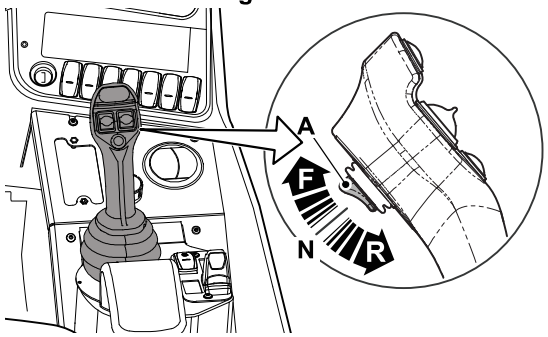
Drive Selection

To select the drive:

1. Stop the machine.
2. Apply the service brake.
3. Let the engine speed drop to idle.
4. Select the required direction.
5. Release the service brake and accelerate.

Drive Selection Switch (Option)

Figure 49.



A Drive selection switch

Your machine may be installed with a drive selection switch that controls the direction of the machine.

The drive selection switch has three positions forward (F), reverse (R) and neutral (N). Press the switch up to select the forward direction, down to select the reverse direction.

To select neutral, position the drive selection switch between the forward and reverse positions. The drive selection switch is disabled if the drive lever is moved from the neutral (N) position. Before you operate the switch, read and understand the principle of operation of the drive lever.

Drive Selection

To select the drive:

1. Stop the machine.
2. Apply the service brake.
3. Let the engine speed drop to idle.
4. Make sure the drive lever is set to neutral (N) position. The drive selection switch is disabled, when the drive lever is set to the forward (F) or reverse (R) position.
5. Make sure that the drive selection switch is set to the neutral (N) position. The machine will not recognise a change in direction unless the switch has first been set to neutral.
6. Press the switch to select the required direction.
7. Release the service brake and accelerate.

Steer Mode Control

⚠ **CAUTION** In 4-wheel steer, the back end of the machine will swing out when you make a turn. Check for clearance before making a turn.

CAUTION Failure to align the steering before selecting the required steer mode will cause the machine to steer incorrectly.

CAUTION Failure to phase 4-wheel steer at least once per day may mean a reduction in steering effectiveness

The steer mode selector is used to select the most suitable steer mode for the terrain and type of work you do.

This machine is a 4-wheel steer machine. Before you drive the machine, understand how the steer modes change the operation of your machine. Refer to: Operation > Driving the Machine > Steer Modes (Page 87).

For effective steering response you must re-phase the steering:

- At least once per day.
- If difficulty in steering.
- After travelling for 24km (15mi) or more on the road (in 2-wheel steer).

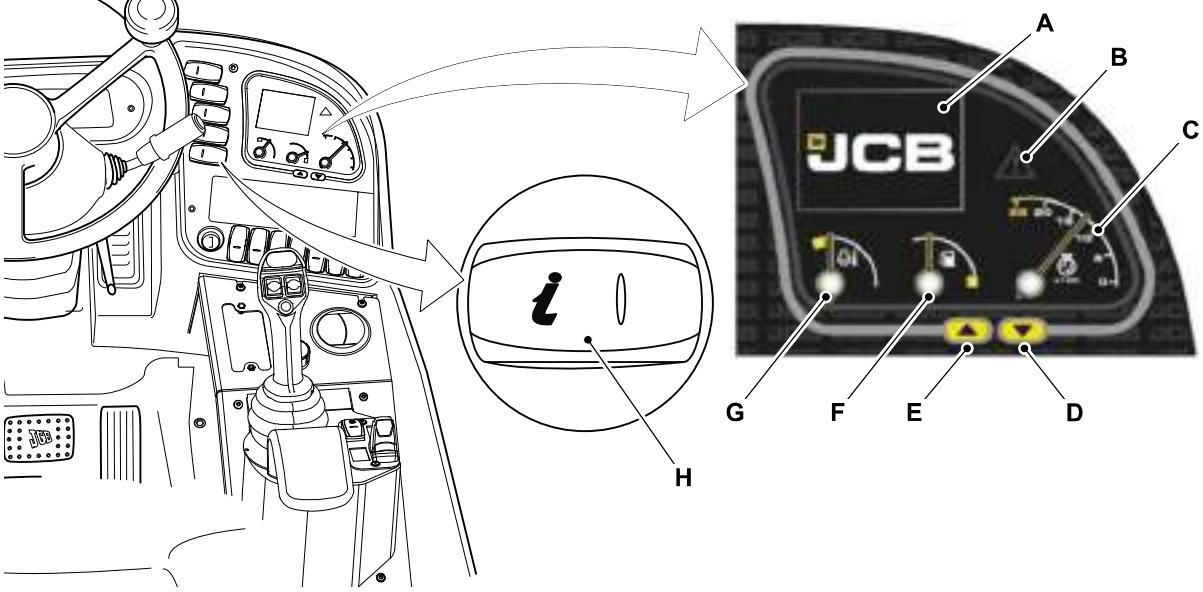
Instruments

Instrument Panel

The instrument panel is located at the front of the cab in the line of sight from the operator's seat.

It provides the interface with the machines electronic system.

Figure 50.



A Display screen
B Warning indicator
C Tachometer
D Navigation button - down
E Navigation button - up
F Fuel level gauge
G Coolant temperature gauge
H Information switch

Main Display Screens

Start-Up Screen

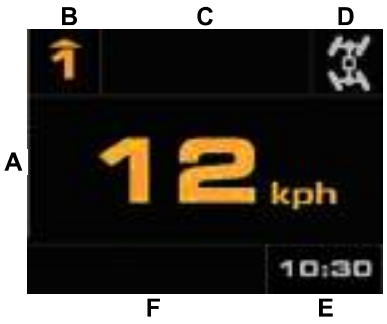
When the ignition switch is switched on the JCB logo is displayed. After 3s the display will show the normal operating mode screen.

Figure 51.

Default Operating Screen (Home Screen)

Displays the machine travel speed, transmission and gear information, steer mode, clock and machine status.

Figure 52.



A Travel speed
B Transmission FNR and gear information
C Transmission status tray
D Steer mode tray
E Clock
F Machine status tray

Transmission Status Symbols

Displays the current transmission status.

Table 10.

	Park brake active
	Driver not in seat
	Symbol shown if travel speed is altered

Auto Steer Mode Symbols (if installed)

Displays the active steer mode in the solid grey.

When changing between the steer modes the amber icons will flash at 1s intervals.

If there is a fault a symbol will flash rapidly, and a notification will be displayed.

Table 11.

	2 Wheel steer mode active
	4 Wheel steer mode active
	Crab steer mode active
	2WS to 4WS (symbol flashes during mode change)

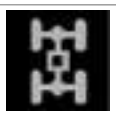
	2WS to crab steer (symbol flashes during mode change)
	4WS to 2WS (symbol flashes during mode change)
	Crab steer to 2WS (symbol flashes during mode change)

Indicated Manual Steer Mode Symbols (if installed)

Displays when the wheels are aligned to straight ahead position.

If there is a fault a symbol will flash rapidly, and a notification will be displayed.

Table 12.

	No wheels are aligned
	Front wheels are aligned
	Rear wheels are aligned
	All wheels are aligned

Machine Status Symbols

Displays the status of various hydraulic systems of the machine.

Table 13.

	SRS (Smooth Ride System) active
	Constant auxiliary mode active
	Secondary auxiliary active
	Auto fan reverse active

	Tilt lock active
	Full lock active or Hydraulic function isolation active
	Loader Pattern Active

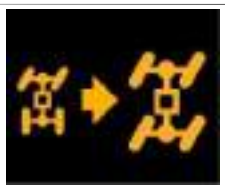
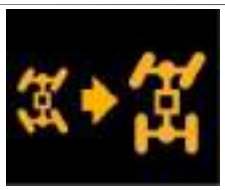
Notification Screens

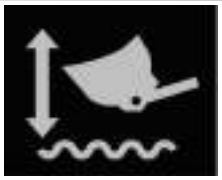
The notification screen displays temporary operator messages such as operator requested mode changes, user input screens, etc.

When a request becomes active, the primary information is displayed on the left half of the main display screen and the notification is displayed on the right side of the main display screen.

If multiple operator notifications become active, only the latest active notification is displayed.

Table 14.

Icon	Event	Buzzer
	Audible/Visual. Steer mode change from 2WS to 4WS	No
	Audible/Visual. Steer mode change from 2WS to crab steer	No
	Audible/Visual. Steer mode change from 4WS to 2WS	No
	Audible/Visual. Steer mode change from crab steer to 2WS	No
	Audible/Visual. Cab heater fan speed setting. Number of yellow bars corresponds to current fan speed setting	No

Icon	Event	Buzzer
	Audible/Visual. Constant auxiliary operational position	No
	Audible/Visual. Constant auxiliary stored position	No
	Audible/Visual. Constant auxiliary cancelled	No
	Audible/Visual. 2nd auxiliary active	No
	Audible/Visual. 2nd auxiliary cancelled	No
	Audible/Visual. SRS active	No
	Audible/Visual. SRS cancelled	No
	Audible/Visual. Hydraulic lock active	No

Icon	Event	Buzzer
	Audible/Visual. Hydraulic lock cancelled	No
	Audible/Visual. Tilt lock active	No
	Audible/Visual. Tilt lock cancelled	No
	Audible/Visual. Transmission disconnect active	No
	Audible/Visual. Transmission disconnect cancelled	No
	Audible/Visual. LLMC (Longitudinal Load Moment Control) override active	No
	Audible/Visual. Air conditioning system active	No
	Audible/Visual. Air conditioning system cancelled	No

Icon	Event	Buzzer
	Audible/Visual. Auto reverse fan active	No
	Audible/Visual. Auto reverse fan cancelled	No
	Audible/Visual. Grid heater active	No
	Audible/Visual. Immobiliser active	No
	Audible/Visual. Warning message active (operator has left the seat, with transmission engaged and park brake disengaged).	Yes

Secondary Level Display Screens

Pressing the information switch and navigation arrows will take the operator to the secondary level display screens.

Press the information switch for less than 2s to cycle through the main screens.

Figure 53.

Fuel information screen

Figure 54.

Machine status screen

Figure 55.

Service information screen

Figure 56.

Machine setup screen

Figure 57.

Fault log screen

Press the information switch for longer than 20s to enter the displayed screen.

Press the arrows to navigate up and down within the main screens.

Fuel Information

To see the fuel information:

Go to the fuel information screen.

Press the information switch for 20s to see the fuel information.

Figure 58.

A Fuel remaining
B Fuel used since last reset
C Fuel used since last fill
D Average fuel consumption

Press the information switch again for 2s to go to the exit screen.

Figure 59.

Exit screen

Press the information switch again for 20s to return to the default operating screen (home screen).

Machine Status

To see the machine status information:

Go to the machine status screen.

Press the information switch for 20s to see the machine status.

Figure 60.

A Battery voltage
B Coolant temperature
C Transmission temperature
D Engine RPM (Revolutions Per Minute)

Figure 61.

E Proportional fan speed
F Engine air intake temperature

Press the navigation arrows to switch between the screens.

Press the information switch again for 2s to the exit screen.

Figure 62.

Exit screen

Press the information switch again for 20s to return to the default operating screen (home screen).

Service Information

To see the service information:

Go to the service information screen.

Press the information switch for 20s to see the service information.

Press the navigation arrows to switch between the screens.

Figure 63.

A Engine hours
B Machine type
C Machine serial number
D Next service interval

Figure 64.

E Time to next service
F RHC (Right Hand Cluster) hardware version number
G RHC software version number
H Tyre diameter

Figure 65.

J Axle ratio

The machine option screens allow the dealer to identify the options installed and the status of each option.

Figure 66.

K Machine options screen 1

Figure 67.

L Machine options screen 2

Press the information switch again for 2s to display the last screen.

Figure 68.

Exit screen

Press the information switch again for 20s to return to the default operating screen (home screen).

Machine Setup

The machine setup screen allows the operator to configure the time, date, brightness, etc.

Press the information switch for 2s to display the main screen.

Press the navigation arrows to scroll down to the machine setup screen.

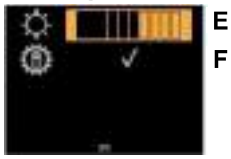
Press the information switch for 2s to active the machine setup screen.

Press the navigation arrows to switch between the available options on the screen.

Figure 69.

A Clock
B Date
C Units of measure
D Gauge backlight brightness

Figure 70.



E Display screen brightness
F Auto torque converter lock-up

Press the information switch again for 2s to display the last screen.

Figure 71.

Exit screen

Press the information switch again for 20s to return to the default operating screen (home screen).

Time Setup

To setup/adjust the time:

1. Go to the machine setup screen.
2. Press the navigation arrows to select the clock.

Figure 72.

3. Press the information switch for specified time.
   Duration: 20s
4. Press the navigation arrows to select the time format.

Figure 73.

5. Press the information switch for the specified time to adjust the clock.
   Duration: 2s
6. Press the information switch for specified time to switch between the hours and minutes. Use the arrows to adjust the values.
   Duration: 2s

Figure 74.

7. Press the information switch for specified time to confirm the setup.
   Duration: 20s

Date Setup

To setup the date:

1. Go to the machine setup screen.

2. Press the navigation arrows to select the date.

Figure 75.

3. Press the information switch for the specified time.
   Duration: 20s
4. Press the navigation arrows to select the date format.

Figure 76.

5. Press the information switch for specified time to adjust the date.
   Duration: 2s
6. Press the information switch for specified time to switch between the day, month and year values. Use the arrows to adjust the values.
   Duration: 2s

Figure 77.

7. Press the information switch for the specified time to confirm the setup.
   Duration: 20s

Brightness

To adjust the brightness of gauge backlight or display screen:

1. Go to the machine setup screen.
2. Press the navigation arrows to select the brightness band.

Figure 78.

3. Press the information switch for the specified time.
   Duration: 20s
4. Press the navigation arrows to increase or decrease the brightness.

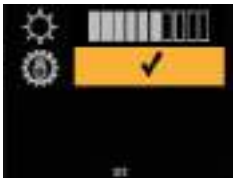
Figure 79.

5. Press the information switch for the specified time to confirm the setup.
   Duration: 20s

Auto Torque Converter Lock-up

1. Go to the machine setup screen.
2. Press the navigation arrows to select the auto torque converter lock-up.

Figure 80.



3. Press the information switch for the specified time.
   Duration: 20s
4. Press the navigation arrows to activate or cancel the auto torque converter lock-up.

Figure 81.

5. Press the information switch for the specified time to confirm the setup.
   Duration: 20s

Fault Log

The fault log screen provide information on the active and previously active faults on the machine. The fault log display screen shows the fault code, time, date, engine hours and number of times that the fault has been active. By default, the fault log display shall only show the active faults. It shall be possible to view active and historical faults by going to the diagnostic menu. Faults shall be displayed in the colour of their severity (critical = red, warning = yellow, trivial = gray).

Figure 82.

If a service fault is recognised by the machine electronic system a fault icon and fault code is displayed on the right side of the home screen. The fault indicator is illuminated amber. The buzzer sounds momentarily when a service fault is active. The code will remain until it is acknowledged by pressing the information button.

Figure 83.

When a critical fault is active, the left area of the main screen will show the fault icon and right area of the main screen will show the fault code. The fault indicator is illuminated red. The buzzer sounds when a critical fault is active. It sounds until the critical fault is no longer active.

Figure 84.

Figure 85.

Warning Lights

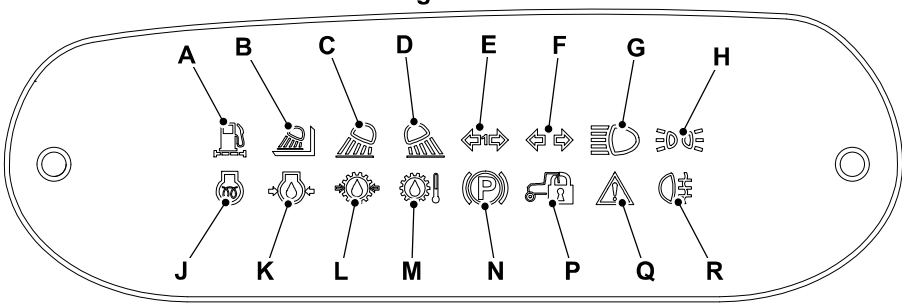
The warning lights are grouped together on a panel located on the dash board.

When a warning light comes on an alarm will sound (depending on security of the condition). The only way to cancel the alarm is to set the ignition switch to position '0'. The problem can then be rectified.

Do not use the machine if it has a fault condition, or you may damage the engine and/or the transmission.

All instruments and indicators will be turned off when the ignition switch is set to off (the hazard warning indicator will still operate if the hazard warning lights are switched on).

Figure 86.



A Low fuel indicator - Not used. Information displayed on instrument panel.

B Lift arm work light - Visual (Amber Light). Illuminates when the lift arm work lights are switched on.

C Front work light - Visual (Amber Light). Illuminates when the front work lights are switched on.

D Rear work light - Visual (Amber Light). Illuminates when the rear work lights are switched on.

E Trailer indicator - Visual Only (Green Light). Flashes with the trailer indicators.

F Direction indicators - Visual only (Green light). Flashes with the direction indicators.

G Main beam - Visual only (Blue light). Illuminates when the headlight main beams are switched on.

H Side lights - Visual only (Green light). Illuminates when the side lights are switched on.

J Grid heater - Not used. Information displayed on instrument panel.

K Engine oil pressure - Visual only (Red light). Operates if the engine oil pressure drops below the normal working pressure.

L Transmission oil pressure - Visual (Red light).Illuminates if the oil pressure drops below the normal working pressure.

M Transmission oil temperature - Not used. Information displayed on instrument panel.

N Park brake engaged - Visual (Red light). Illuminates when the park brake is engaged.

P Immobiliser - Not used. Information displayed on instrument panel.

Q Master warning - Not used. Information displayed on instrument panel.

R Fog lights - Visual only (Amber light). Illuminates when the fog lights are switched on.

Getting the Machine Moving

General

⚠ **WARNING** Operating the machine on hillsides can be dangerous if proper precautions are not taken. Ground conditions can be changed by rain, snow, ice etc. Check the site carefully. Going uphill, reverse when unloaded or travel forwards when loaded. Going downhill, travel forwards when unloaded or reverse when loaded. Take special care when 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.

WARNING Do not dismount a moving machine.

WARNING Always drive a loaded machine forward uphill and in reverse downhill. Always drive an unloaded machine in reverse uphill and forward downhill.

The machine can be put in motion in any gear. But do not over work the engine unnecessarily by using too high a gear for example, on a hill. Operating in too high a gear will overheat the torque converter fluid. When moving the machine, keep it under control at all times. Stay alert for obstructions and possible hazards.

Do not use the pedals as footrests. Do not coast the machine in neutral, you will not have full control. Also, coasting the machine will damage the transmission.

Do not turn on or drive across a slope. Select the necessary gear before starting down a slope. Use the same gear you would use to go up the slope. Do not change gear on the slope.

If the load will be pushing the machine on a downslope, select first gear (1) before starting downhill. Use the brake pedal to prevent overspeeding down a slope.

Approach deep mud in first gear (1) with the front wheels straight.

After you have warmed up the engine and tested the park brake, move off as described below.

1. Check your seat belt and seat.

   1.1. Make sure that your seat belt is correctly fastened.

   1.2. Make sure that the seat is correctly adjusted.

   CAUTION! *In 4-wheel steer, the back end of the machine will swing out when you make a turn. Check for clearance before making a turn.*

2. Select the required steer mode. Remember that the steering may temporarily remain in the last selected mode until the rear wheels pass through the 'straight ahead' position.

   WARNING! *You or others can be killed or injured if you suddenly change from forward to reverse, or vice versa, when travelling. Exaggerated and unnecessary movements of the lever(s) may rapidly reverse the travel direction of the machine without warning to others. Always follow the recommended procedure for changing between forward and reverse drive.*

   WARNING! *Do not change from a high gear to a low gear (for instance, 4th to 1st) in one sudden movement when the machine is moving. Otherwise the machine will rapidly decelerate, you or others could be killed or seriously injured. When selecting lower gears, allow the engine speed to drop before each gear change.*

3. Select Transmission Disconnect mode - on or off (if installed).

4. Check the boom is in the travel position.

5. Push the brake pedal(s) hard down.

6. Select forward or reverse. If the park brake is engaged when forward/reverse is selected, the Park Brake Engaged Indicator will come on and an audible alarm will sound.

7. Release the park brake.

8. Make sure it is safe to move off, then release the brake pedals and push down on the accelerator pedal. The machine will move smoothly away.

9. While the machine is travelling slowly, check the steering and brakes. Do not drive the machine unless the steering and brakes are working correctly. If you are not sure, assume they are faulty.

Driving the Machine

Steer Modes

Wheel Alignment

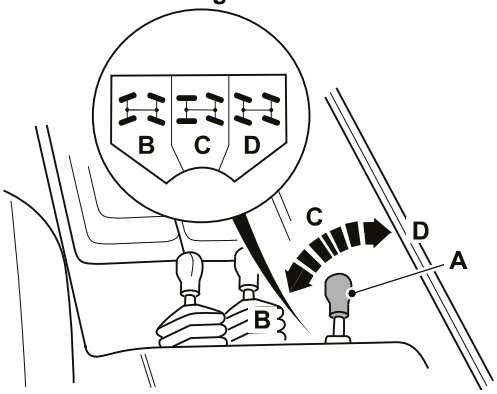
Indicated Manual

Before you select the required steer mode, make sure the wheels are aligned correctly.

To align the wheels:

1. Stop the machine. Set the gear lever to neutral position.
2. Use the lever to select 4-wheel steer.
3. Turn the steering wheel until the rear wheels are in the straight ahead position as shown.
   Refer to: Operation > Instruments > Instrument Panel (Page 69).
4. Use the lever to select 2-wheel steer.
5. Turn the steering wheel until the front wheels are in the straight ahead position as shown.
   Refer to: Operation > Instruments > Instrument Panel (Page 69).
6. All wheels are now aligned in the straight ahead position. Select the steer mode required and continue in the normal manner.

Figure 87.



A Steer mode selector lever
B 4-wheel steer
C 2-wheel steer
D Crab steer

Electronic Steer Mode

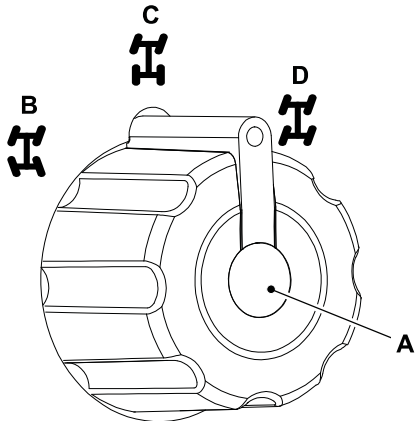
Before you select the required steer mode, make sure the wheels are aligned correctly.

To align the wheels:

1. Stop the machine. Set the gear lever to neutral position.
2. Use the switch to select 2-wheel steer.
   2.1. Sensors on the axles prevent the steer mode from changing until the wheels are aligned in the straight ahead position.
   2.2. A symbol will appear on the main screen display to show the requested change of mode. This will flash whilst the mode change takes place.
3. Turn the steering wheel until the rear wheels are in the straight ahead position.
   3.1. When the rear wheels are straight ahead position the machine will go to 2-wheel steer. The symbol stops flashing and change to indicate when 2-wheel steer is active.

4. Use the switch to select 4-wheel steer.
5. Turn the steering wheel until the front wheels are in the straight ahead position.
6. All wheels are now aligned in the straight ahead position. Select the steer mode required and continue in the normal manner.

Figure 88.



A Steer mode selector switch
B 4-wheel steer
C 2-wheel steer
D Crab steer