SAFETY NOTICES

⚠ WARNING

Study This Handbook Before Starting The Machine

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

INT-1-1-1

⚠ CAUTION

Do not fit an attachment to this machine which is not JCB approved. Consult your JCB distributor before fitting any non approved attachment.

8-4-1-6

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

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

MACHINE SECURITY

Vandalism and theft of unattended machines is an ever increasing problem and JCB is doing everything possible to help combat this.

JCB PLANTGUARD is a comprehensive package available to help you safeguard your machine. It includes such devices as vandal proof covers, window etching, immobiliser, concealed serial number, battery isolator, Tracker security system and much more.

Remember that the fitting of any one of these security devices will help to minimise not only the damage or loss of your machine but also subsequent lost productivity. It could also result in reduced insurance premiums.

Your JCB Distributor or Dealer will be pleased to provide information on any of these sensible precautions. ACT NOW!

INT-1-2-4

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ABOUT THIS HANDBOOK

Machine Model and Serial Number

This handbook provides information for the following models in the JCB machine range.

530 from Serial No. 768740
530FS Plus
530FS Super (530SXL France)
532 from Serial No. 768700
533-105
535 from Serial No. 777362
537 from Serial No. 768700
540-70 from Serial No. 771026
540-170
540FS Plus
540FS Super (540SXL France)

Using this Handbook

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

This handbook is arranged to give you a good understanding of the machine and its safe operation. It also contains maintenance information and specification data. Read this handbook from front to back before using the machine for the first time. Particular attention must be given to all the safety aspects of operating and maintaining the machine.

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

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

The manufacturer's policy is one of continuous improvement. The right to change the specification of the machine without notice is reserved. No responsibility will be accepted for discrepancies which may occur between specifications of the machine and the descriptions contained in this publication.
INT-1-2-5/1

Units of Measurement

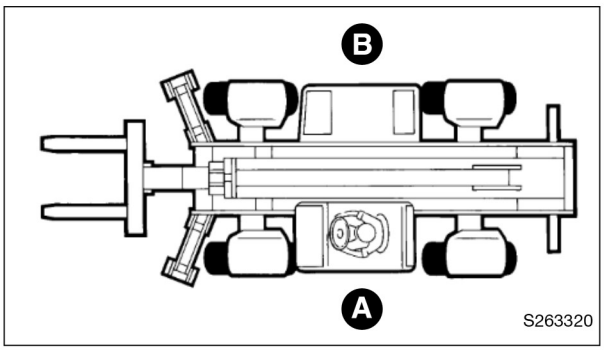
In this handbook, the S.I. system of units is used. For example, liquid capacities are given in litres. The Imperial units follow in parenthesis ( ) eg 28 litres (6 gal).

Page Numbering

The page numbering system in this handbook is not continuous. There is a gap of about ten pages between sections. This allows for the insertion of new pages in later issues of the handbook.

Left Side, Right Side

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



Using the Machine

To use the machine efficiently **and 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. This handbook instructs you on the machine, its controls and its safe operation. It is not a training manual on the art of loading. 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.**

Page Cross References

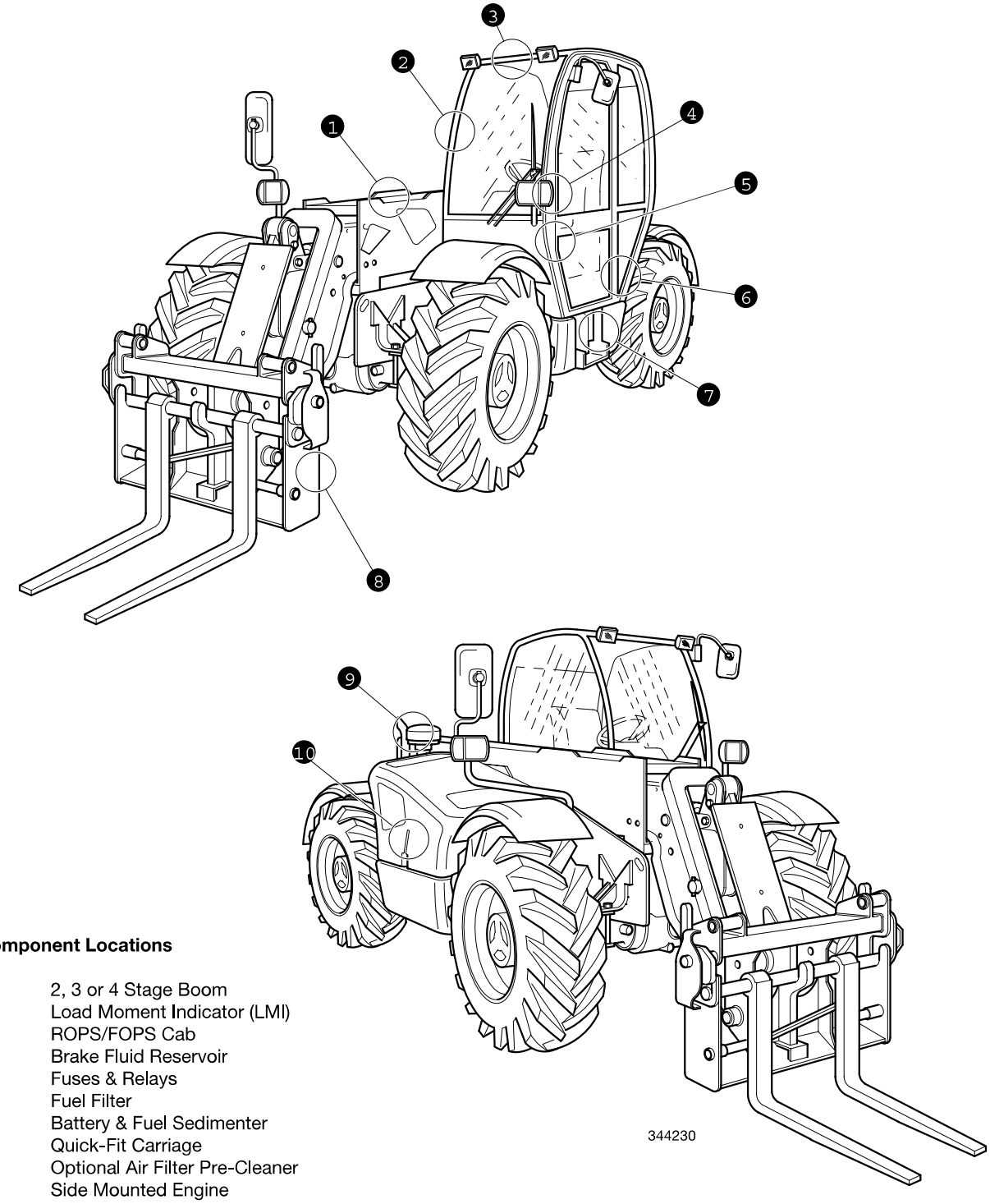
In this handbook, page cross references are made by presenting the subject title printed in bold and italic to signify a cross reference. (This is followed by the title of the section containing the subject). For example:

Make sure the tyres are correctly inflated, see ***Tyre Pressures*** *(SPECIFICATION section)* for the correct tyre pressures and ***Inflating the Tyres*** *(MAINTENANCE section)* for a safe procedure for inflating the tyres.

MACHINE DESCRIPTION

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.



Component Locations

1	2, 3 or 4 Stage Boom
2	Load Moment Indicator (LMI)
3	ROPS/FOPS Cab
4	Brake Fluid Reservoir
5	Fuses & Relays
6	Fuel Filter
7	Battery & Fuel Sedimenter
8	Quick-Fit Carriage
9	Optional Air Filter Pre-Cleaner
10	Side Mounted Engine

SAFETY - YOURS AND OTHER PEOPLE'S

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

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

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

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

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

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

Remember

BE CAREFUL
BE ALERT
BE SAFE

INT-1-31/1

SAFETY - CHECK LIST

As well as the warnings in this chapter, specific warnings are given throughout the book. This section is designed to give a safety code for use of the machine generally and for operation and maintenance practices.

General Safety

⚠ WARNING

Handbook

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

INT-1-3-2

⚠ WARNING

Decals

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

INT-1-3-4

⚠ CAUTION

Hazardous Atmospheres

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

INT-2-1-14

⚠ WARNING

Clothing

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

INT-1-3-6

⚠ WARNING

Care and Alertness

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

INT-1-3-5

⚠ DANGER

Lightning

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

5-1-1-2

⚠ WARNING

Raised Boom

A raised boom can fall or be lowered accidentally. Do not walk under a raised boom which is not fitted with a safety strut, or you could be injured.

5-1-1-1

⚠ WARNING

Lifting Equipment

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

INT-1-3-7

SAFETY CHECK LIST (continued)

Operating Safety

⚠ WARNING

Practice

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

INT-2-1-1

⚠ WARNING

Machine Condition

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

INT-2-1-2

⚠ WARNING

Machine Limits

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

INT-2-1-4

⚠ CAUTION

Work Site

Work sites can be hazardous. Inspect the site before working on it. Check for potholes, weak ground, hidden rocks etc. Check for utilities *(electric cables, gas and water pipes etc.)* Mark the positions of underground cables and pipes. Make sure you have enough clearance beneath overhead cables and structures. *See **Working With the Loadall** (OPERATION section)* for more information about the danger of electrical cables.

5-1-3-1/1

⚠ DANGER

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.

INT-2-2-10

⚠ WARNING

Safe Working Loads

Overloading the machine can damage it and make it unstable. Study the lifting and/or digging specifications in this handbook before using the attachments

INT-2-2-11/1

⚠ WARNING

ROPS/FOPS Structure

The machine is fitted with a Roll Over Protection Structure (ROPS) and a Falling Objects Protection Structure (FOPS). You could be killed or seriously injured if you operate the machine with a damaged or missing ROPS/FOPS. If the ROPS/FOPS 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 certification.

INT-2-1-9/3

⚠ WARNING

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.

INT-2-1-5

⚠ WARNING

Passengers

Passengers in or on the machine can cause accidents. The JCB Loadall is a one man machine. Do not carry passengers.

INT-2-2-2

⚠ WARNING

Exhaust Gases

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

INT-2-1-10

⚠ WARNING

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. Work sites can be noisy, do not rely on spoken commands.

INT-2-2-3

⚠ WARNING

Visibility

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

INT-2-1-11

SAFETY CHECK LIST (continued)

⚠ WARNING

Scaffolding

Overloaded scaffolding can collapse. Never load scaffolding beyond the regulation capacity.

5-1-4-6

⚠ DANGER

Forks/Working Platform

Using the forks alone as a working platform is hazardous; you can fall off and be killed or injured. Never use the forks as a working platform.

5-1-5-3

⚠ CAUTION

Regulations

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

INT-1-3-3

⚠ WARNING

Forks/Turning

The forks extend beyond the end of the boom. Make sure there is enough clearance for the forks when making turns.

5-1-5-4

⚠ WARNING

Fires

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the operators cab 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 should use self-contained breathing apparatus

INT-3-2-7/1

Maintenance Safety

⚠ WARNING

Repairs

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

INT-3-1-1

⚠ WARNING

Modifications and Welding

Non-approved modifications can cause injury and damage. Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Contact your JCB distributor for advice before modifying the machine.

INT-3-1-2/1

⚠ WARNING

Metal Splinters

You can be injured by flying metal splinters when driving metal pins in or out. Use a soft-faced hammer or drift to remove and fit metal pins. Always wear safety glasses.

INT-3-1-3

⚠ WARNING

Asbestos

Asbestos dust can damage your lungs. Some engine gaskets contain asbestos. Do not dismantle the engine or exhaust system; get these jobs done by a qualified person who has a copy of the engine service manual.

5-1-6-1

⚠ WARNING

Boom Safety Strut

A raised boom can drop suddenly and cause serious injury. Before working under a raised boom, fit the boom safety strut. *See **Boom Safety Strut** (MAINTENANCE section).*

5-1-5-7

⚠ WARNING

Communications

Bad communications can cause accidents. If two or more people are working on the machine, make sure each is aware of what the others are doing. Before starting the engine make sure the others are clear of danger areas; examples of danger areas are: the rotating blades and belt on the engine, the attachments and linkages, and anywhere beneath or behind the machine. People can be killed or injured if these precautions are not taken.

INT-3-1-5

⚠ WARNING

Oil

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

INT-3-2-3

SAFETY CHECK LIST (continued)

⚠ WARNING

Hydraulic Fluid

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

INT-3-1-10/1

⚠ WARNING

Hydraulic Pressure

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

INT-3-1-11/1

⚠ WARNING

Jacking

A machine can roll off jacks and crush you unless the wheels have been chocked. Always chock the wheels at the opposite end of the machine that is to be jacked. Do not work underneath a machine supported only by jacks. Always support a jacked-up machine on axle stands before working underneath it.

INT-3-2-8

⚠ WARNING

Hydraulic Hoses

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:
Damaged end fittings
Chafed outer covers
Ballooned outer covers
Kinked or crushed hoses
Embedded armouring in outer covers
Displaced end fittings.

INT-3-3-2

⚠ WARNING

Petrol

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

INT-3-1-6

⚠ WARNING

Fluoroelastomeric Materials

Certain seals and gaskets (e.g. crankshaft oil seal) on JCB machines contain fluoroelastomeric materials such as Viton, Fluorel and Technoflon. Fluoroelastomeric materials subjected to high temperatures can produce highly corrosive hydrofluoric acid. THIS ACID CAN SEVERELY BURN.

New fluoroelastomeric components at ambient temperature require no special safety precautions.

Used fluoroelastomeric components whose temperatures have not exceeded 300°C require no special safety precautions. If evidence of decomposition (e.g. charring) is found, refer to the next paragraph for safety instructions DO NOT TOUCH COMPONENT OR SURROUNDING AREA.

Used fluoroelastomeric components subjected to temperatures greater than 300°C (e.g. engine fire) must be treated using the following safety procedure. Make sure that heavy duty gloves and special safety glasses are worn:

1 Ensure that components have cooled then remove and place material into plastic bags.

2 Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.

3 Thoroughly wash contaminated area with detergent and water.

4 Contain all removed material, gloves etc. used in this operation in sealed plastic bags and dispose of in accordance with Local Authority Regulations.

DO NOT BURN FLUOROELASTOMERIC MATERIALS.

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Get medical attention immediately.

INT-3-3-5/1

⚠ CAUTION

'O' rings, Seals and Gaskets

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

INT-3-2-12

SAFETY CHECK LIST (continued)

⚠ WARNING

Counterweights

Your machine may be fitted with counterweights. They are extremely heavy. Do not attempt to remove them.

INT-3-2-5

⚠ WARNING

Raised Machine

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

INT-3-3-7/1

⚠ CAUTION

Arc Welding

Before carrying out arc welding on the machine, disconnect the battery and alternator to protect the circuits and components.

The battery must still be disconnected even if a battery isolator is fitted.

Make sure that the welding earth return path is kept as short as possible. This prevents high currents being induced in the machine chassis or wiring harness.

If the machine is equipped with electronic control units (ECUs), then disconnect them before welding. Failure to disconnect the ECUs could result in irreparable damage to the electronic components.

INT-3-1-15

⚠ CAUTION

Under no circumstances must the engine be run with the transmission in gear and only one driving wheel jacked clear of the ground, since the wheel on the ground will move the machine.

INT-3-1-16

⚠ CAUTION

Cleaning

Cleaning metal parts with incorrect solvents can cause corrosion. Use only recommended cleaning agents and solvents.

INT-3-2-11

⚠ CAUTION

Machine Modifications

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

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

INT-1-3-10

⚠ CAUTION

When carrying out welding or grinding operations near soundproofing materials, shield the material from direct flame or sparks as this could cause material to burn.

0084

SAFETY DECALS

⚠ WARNING

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

Keep all decals clean and readable. Replace lost or damaged decals. The decals and their attachment points on the machine are shown on the following pages. Each decal has a part number printed on it. Use this number to order a new decal from your JCB distributor.

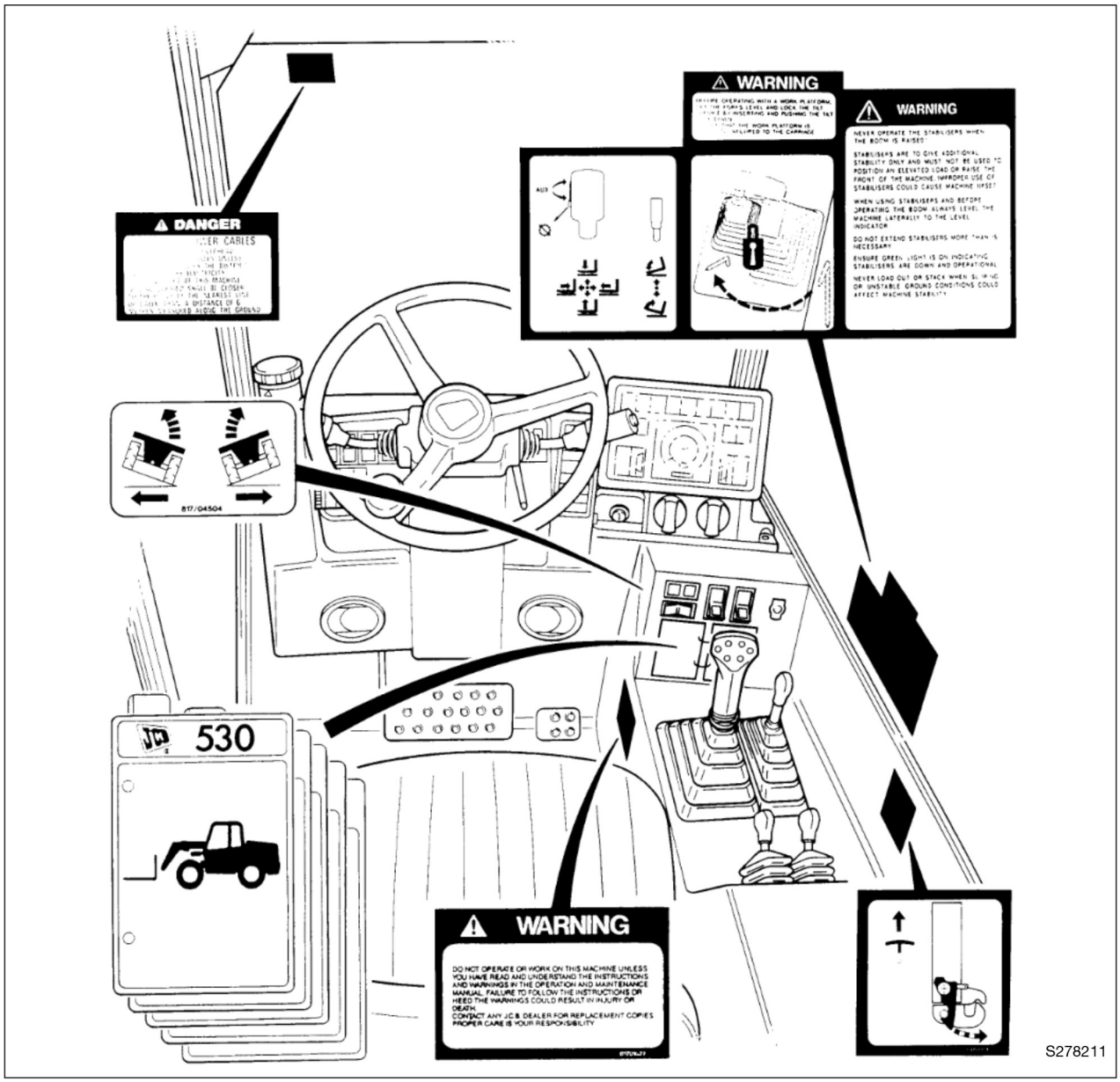
INT-3-3-3

⚠ WARNING

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

INT-3-3-4

Note: *The decals shown are representative and vary according to each machine. Consult your Parts Book for the correct part when ordering a replacement.*



IDENTIFYING YOUR MACHINE

Identification Plate

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

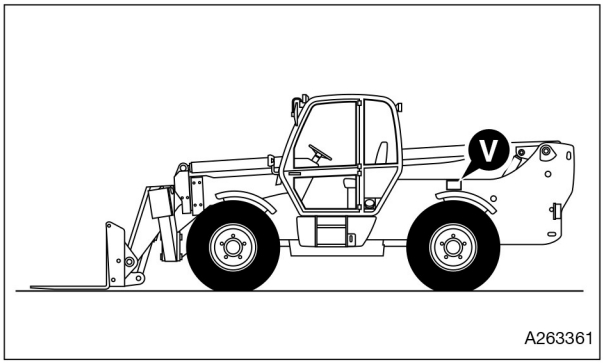
The serial number of each major unit is also stamped on the unit itself. If a major unit is replaced by a new one, the serial number on the identification plate will be wrong. Either stamp the new number of the unit on the identification plate, or simply stamp out the old number. This will prevent the wrong unit number being quoted when replacement parts are ordered.

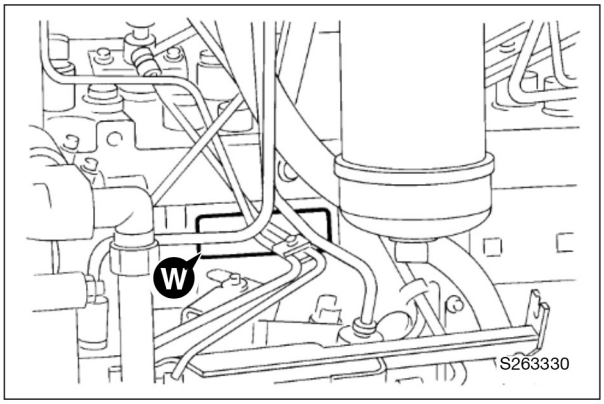
The machine and engine serial numbers can help identify exactly the type of equipment you have.

Typical Machine Identification Number

532 754001
A B

A 500 Series machine range
B Machine Serial number





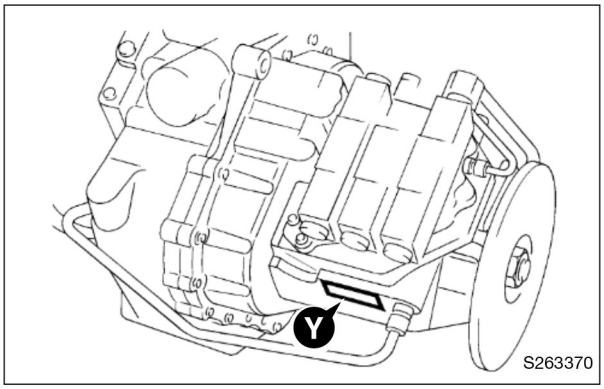
Unit Identification

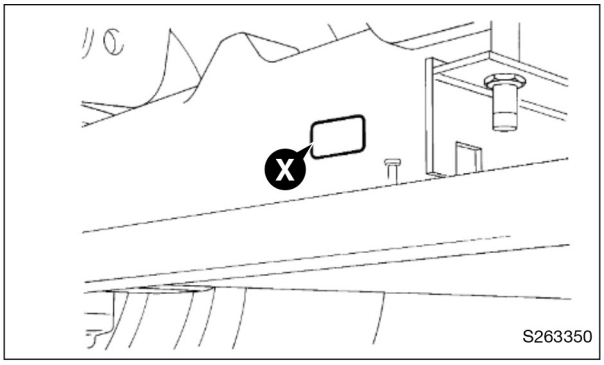
The engine serial number is stamped on label **W** which is fastened to the right side of the cylinder block, near the fuel filter.

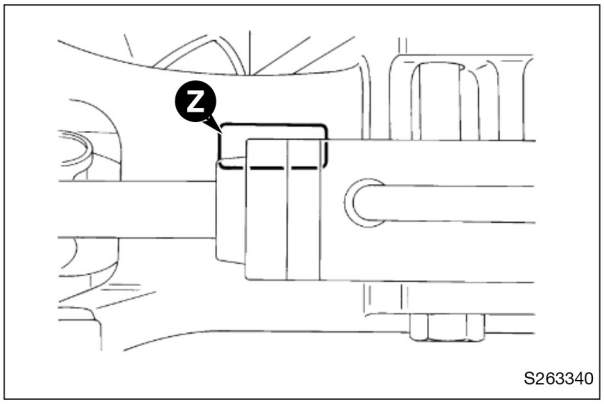
The transmission serial number is stamped on label **Y** which is mounted on the side face.

The rear axle serial number is stamped on plate **X** mounted to the front face of the axle.

The front axle serial number is stamped on plate **Z** mounted to the rear face of the axle.







JCB IMMOBILISER OPTION

Operating Instructions

The JCB Immobiliser incorporates latest Electronic Immobiliser technology and is operated by an Electronically coded key.

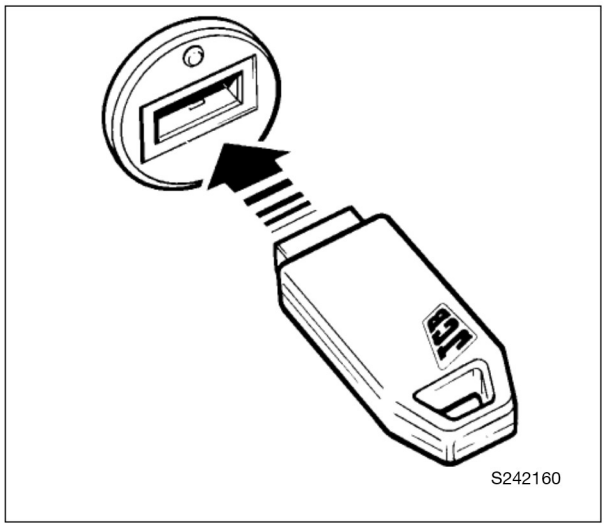
The components required to operate the JCB Immobiliser are:

Yellow JCB Immobiliser Electronically coded key.
Instrument panel mounted Immobiliser key receptacle.

Follow the instructions below to Activate and Deactivate the JCB Immobiliser system.

Activation

The vehicle is automatically immobilised 15 seconds after switching off the engine ignition system.
The L.E.D. (Light Emitting Diode) in the JCB Immobiliser key receptacle flashes when the immobiliser is activated.



S242160

Deactivation

To start the vehicle engine the JCB Immobiliser Electronic key must be inserted and removed from the Immobiliser key receptacle, the L.E.D. will then extinguish indicating the Immobiliser has deactivated. The vehicle ignition key is operated to start the engine in the normal way but within 10 to 15 seconds otherwise the system will reactivate itself.

If the Immobiliser key remains inserted in the receptacle the engine will not start.

If the Immobiliser key is inserted in the receptacle for longer than 15 seconds the L.E.D. in the Immobiliser key receptacle will begin to flash indicating activation of the system. To deactivate the Immobiliser first remove the electronic key from the receptacle, then re-insert the key and remove it within 5 to 10 seconds.

NEVER TURN OR ATTEMPT TO TURN THE JCB IMMOBILISER ELECTRONIC CODED KEY WHEN IT HAS BEEN INSERTED INSIDE THE KEY RECEPTACLE.

Additional and/or replacement Immobiliser Electronic keys (Maximum of 5 keys) can be supplied on request from your approved installing JCB distributor provided that one of the two Electronic keys originally supplied with the Immobiliser is still available.

INTRODUCTION

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

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

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

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

Get to know the 'feel' of the machine and its driving controls. Move on to the attachment controls only when you can drive the machine confidently and safely.

Take great care when practicing with the attachment controls. Practice in an open space. Keep people clear. Do not jerk the controls; operate them slowly until you understand the effect they have on the machine.

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

Remember

BE CAREFUL

BE ALERT

BE SAFE

BEFORE ENTERING THE CAB

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

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

⚠ WARNING

Walking or working under a raised boom can be hazardous. You could be crushed if the boom falls or is inadvertently lowered.

Lower the boom fully before doing these checks. If you are new to this machine, get an experienced operator to lower it for you.

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

5-2-1-1

1 Check for cleanliness:

- **a** Clean the windows, light lenses and rear view mirrors.
- **b** Remove dirt and debris, especially from around the linkages, rams, pivot points and radiator.
- **c** Make sure the cab step and handholds are clean and dry.
- **d** Clean all safety decals. Replace any that are missing or cannot be read.

2 Check for damage:

- **a** Inspect the machine generally for damaged and missing parts.
- **b** Make sure that all pivot pins are secured correctly in place.
- **c** Inspect the windows for cracks and damage.
- **d** Check for oil, fuel and coolant leakages beneath the machine.

BEFORE ENTERING THE CAB (continued)

⚠ 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.
2-2-1-2

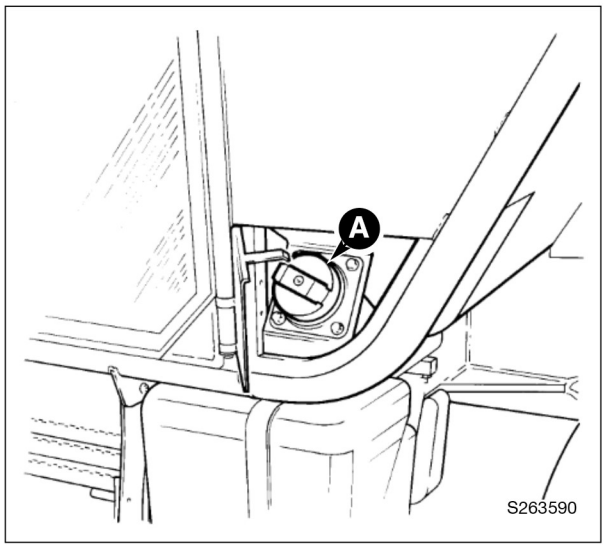
3 Make sure the tyres are correctly inflated. *See **Tyre Inflation** in MAINTENANCE section* for a safe procedure for inflating the tyres.

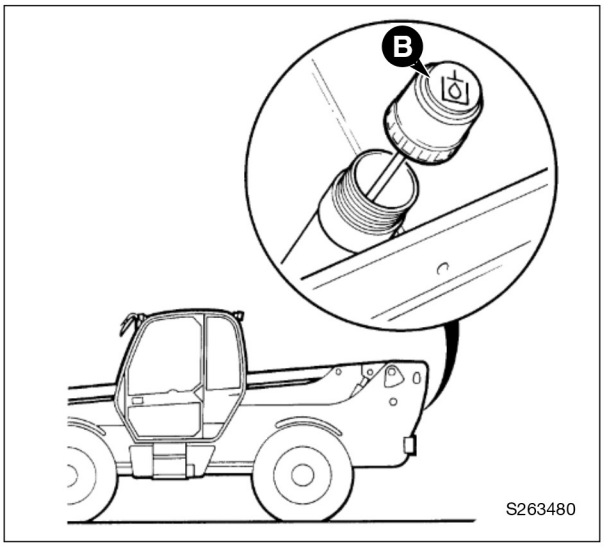
Check for cut rubber and penetration by sharp objects. Do not use a machine with damaged tyres.

4 Make sure the engine cover is closed and secure. *(We also recommend that you lock it.)*

5 Make sure the fuel filler cap **A** is tight. *(We also recommend that you lock it.)*

6 Make sure the hydraulic oil filler cap **B** is tight and the rear cover is closed and secure.



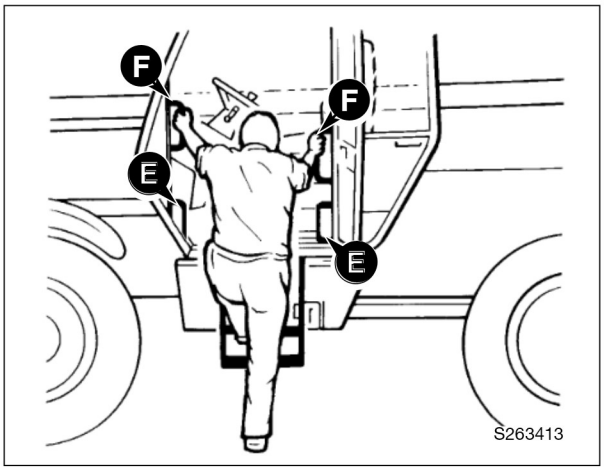


ENTERING & LEAVING THE CAB, DOORS AND WINDOWS

⚠ WARNING

Entering or leaving the cab or canopy 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.
INT-2-1-7/1

Use the handholds **E** (if fitted) and **F** when entering or leaving the cab. Do not use the steering wheel as a handhold.



ENTERING & LEAVING THE CAB, DOORS AND WINDOWS (continued)

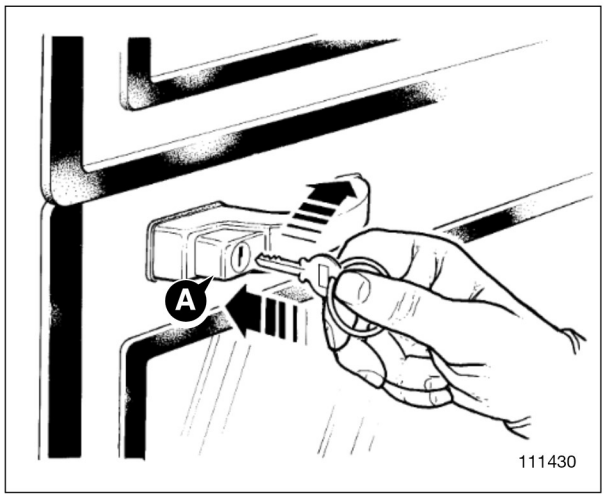
Opening and Closing the Door

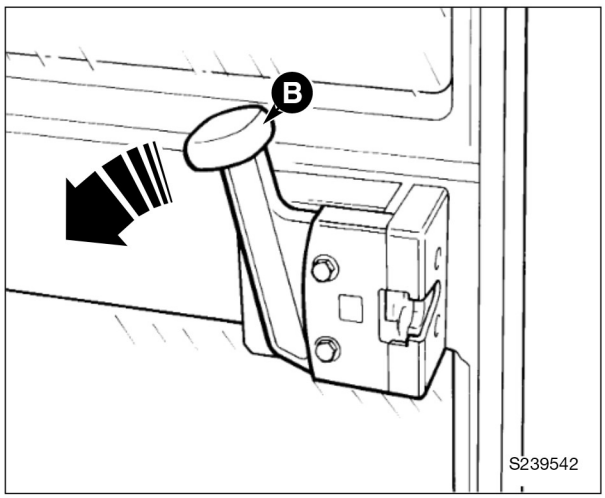
To open the door from the outside, unlock it with the key provided and lift latch **A**.

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

To open the door from the inside, pull lever **B**.

***Note**: Do not drive the machine with the door unlatched.*

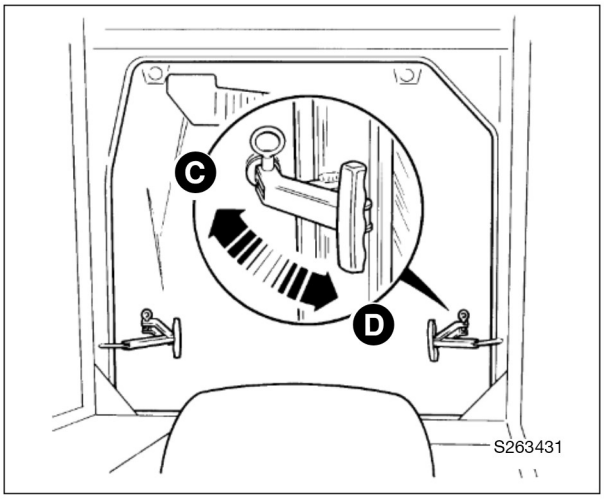




Opening and Closing the Rear Window

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

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



ENTERING & LEAVING THE CAB, DOORS AND WINDOWS (continued)

Opening and Closing the Upper Door Section

With the door closed, release the upper section by pulling lever **E** to the rear. Using hand hold **F**, swing the door fully open until it latches onto the catch **G**.

To close the upper door section, pull lever **H** up and swing the door closed using hand hold **F**. Ensure the upper door latches onto the lower door.

Emergency Exit

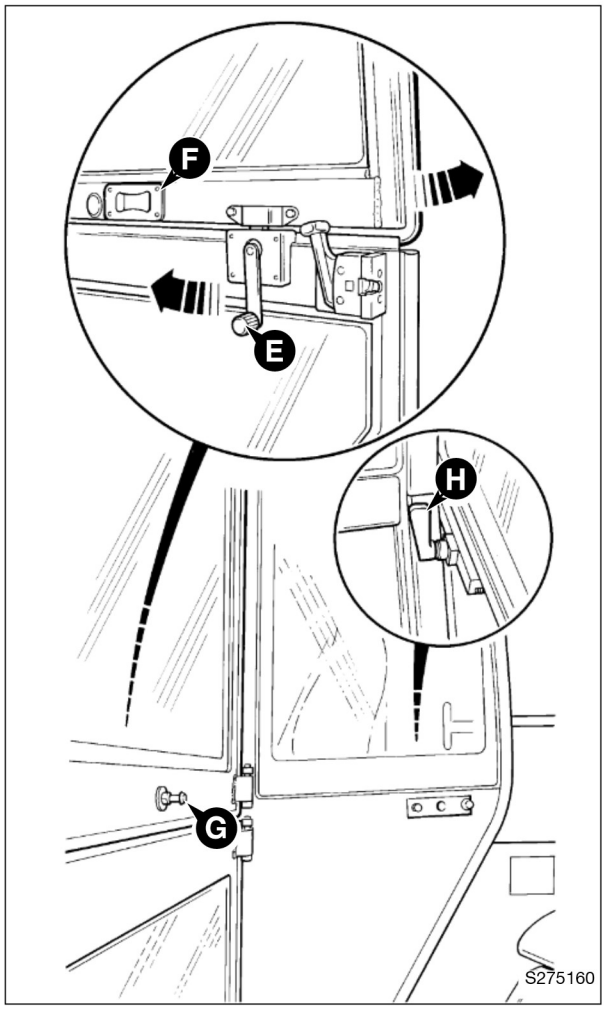
The rear window can be quickly fully opened in the event of an emergency. To fully open the window, do the following:-

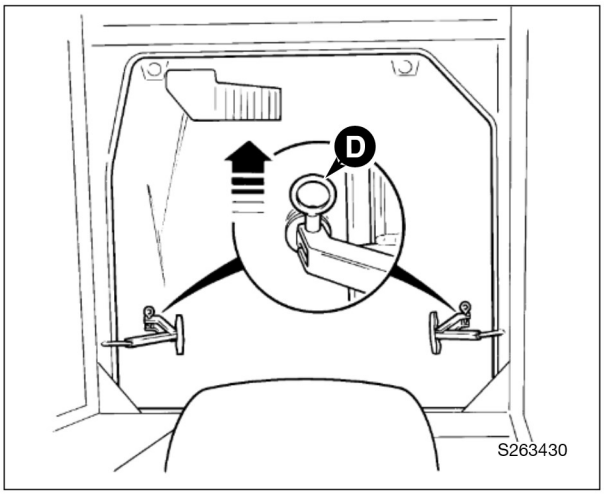
⚠ WARNING

Do not obstruct the rear cab window, this is an Emergency Exit.
5-2-1-9

1 Remove pins **D** and open the window fully.

***Note**: Pins **D** should only be removed in the event of an emergency exit. Do not remove simply to increase the rear window opening.*





SEAT CONTROLS

Adjusting the Seat

The operators seat can be adjusted for your comfort. A correctly adjusted seat will reduce operator fatigue. Position the seat so that you can comfortably reach the machine controls. For driving the machine, adjust the seat so that you can depress the brake pedals fully with your back against the seat back.

Seat Type 1

Fore/Aft

Move lever **4** upwards and slide the seat to the position you want. Release lever **4**. Make sure the seat is locked in position.

Height/Weight

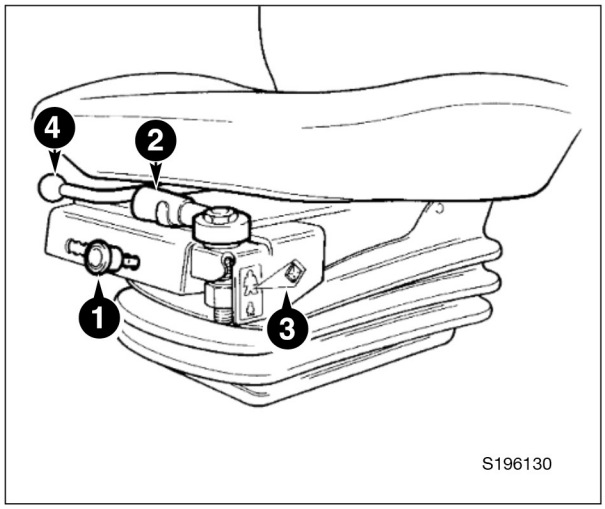
Sit on the seat. Pull knob **1** forward to disengage and slide it fully horizontal in the + direction.

Operate ratchet handle **2** to adjust the seat up or down to the desired height.

A light driver will require the pointer **3** to be close to the 'small person' symbol. To adjust the pointer in this direction operate the ratchet handle **2** with its - sign adjacent to the metal lug.

For a heavier driver, reverse the ratchet handle **2** by pulling and twisting through 180° so the + sign is adjacent to the lug and then operate the handle to bring the pointer close to the 'large person' symbol.

If the upwards travel of the seat is excessive, adjust the control knob **1** in the - direction to restrict the upwards motion.



Seat Type 2

Fore/Aft

Lift bar **1** and slide the seat to the position you want. Release the lever. Make sure the seat is locked in position.

Backrest Angle

Press your back firmly against the backrest. Press down either of the two levers **2** and put the backrest at the angle you want. Release lever **2**.

Height

To raise or lower the front of the seat, pull bar **3** up and raise or lower the seat cushion. Release the bar at the height you want. *(There are five settings.)*

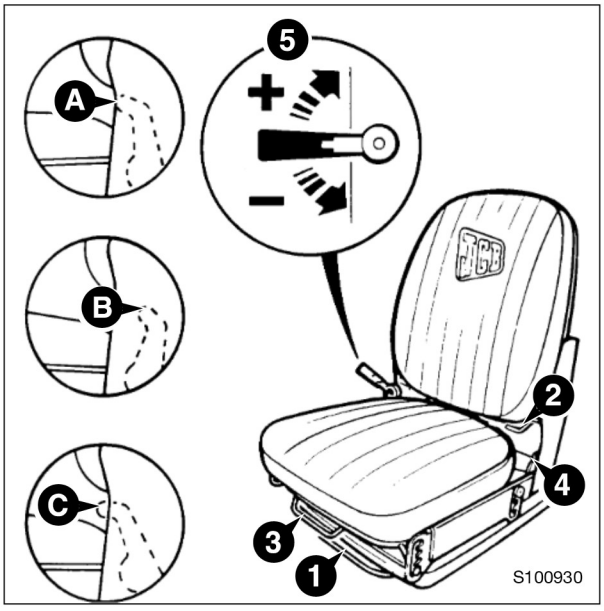
To raise or lower the rear of the seat, lift the rear of the seat cushion and push backwards, then set it into one of the three notches provided.

Weight

Sit in the seat and check the position of indicator **4**. It should be level with the front edge of the side frame as shown in **A**.

If the indicator is behind the frame as shown in **B**, turn the handle **5** so that + is uppermost. If the indicator is in front of the frame as in **C**, turn handle **5** so that - is uppermost.

Stay in the seat. Pump handle **5** until the indicator is level as in **A**.



SEAT CONTROLS (continued)

Seat Type 3 (Air Suspension)

Fore/Aft

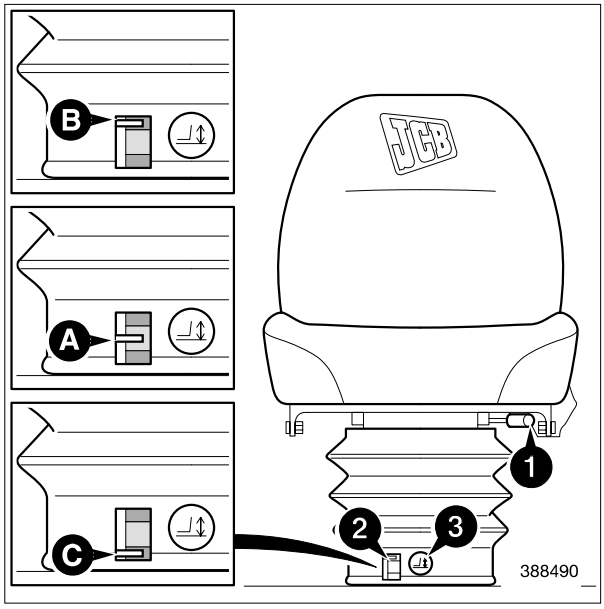
Move lever **1** upwards and slide the seat to the position you want. Release lever **1**. Make sure the seat is locked in position.

Height/Weight

Sit on the seat and check the position of indicator **2**. It should be in the green zone as shown at **A**.

If the indicator is above the green zone, as shown at **B**, pull knob **3** to deflate the air suspension unit.

If the indicator is below the green zone, as shown at **C**, push knob **3** to inflate the air suspension unit.



SEAT BELT

Fasten the Seat Belt

⚠ 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.
2-2-2-1

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

2 Make sure the seat belt is across your hips not over your stomach.

Release the Seat Belt

1 Press button **C** and pull the male fitting **A** from the buckle.

Adjust the Seat Belt

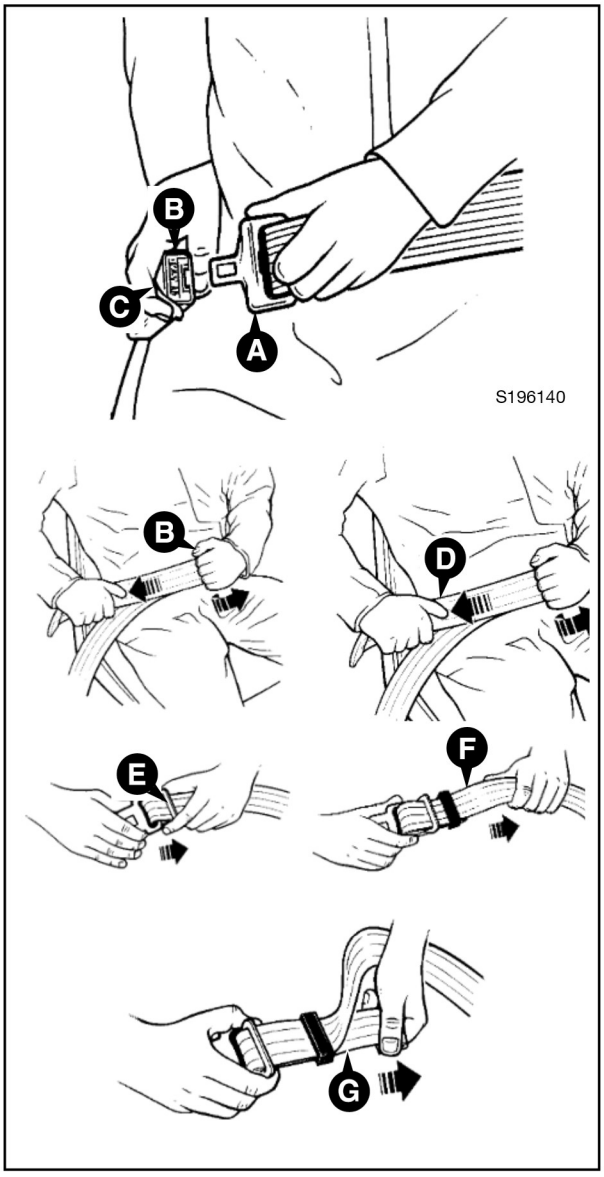
Make sure the belt is across your hips and not over your stomach. Each side of the belt can be adjusted separately. Keep the buckle **B** central.

To adjust the buckle side:

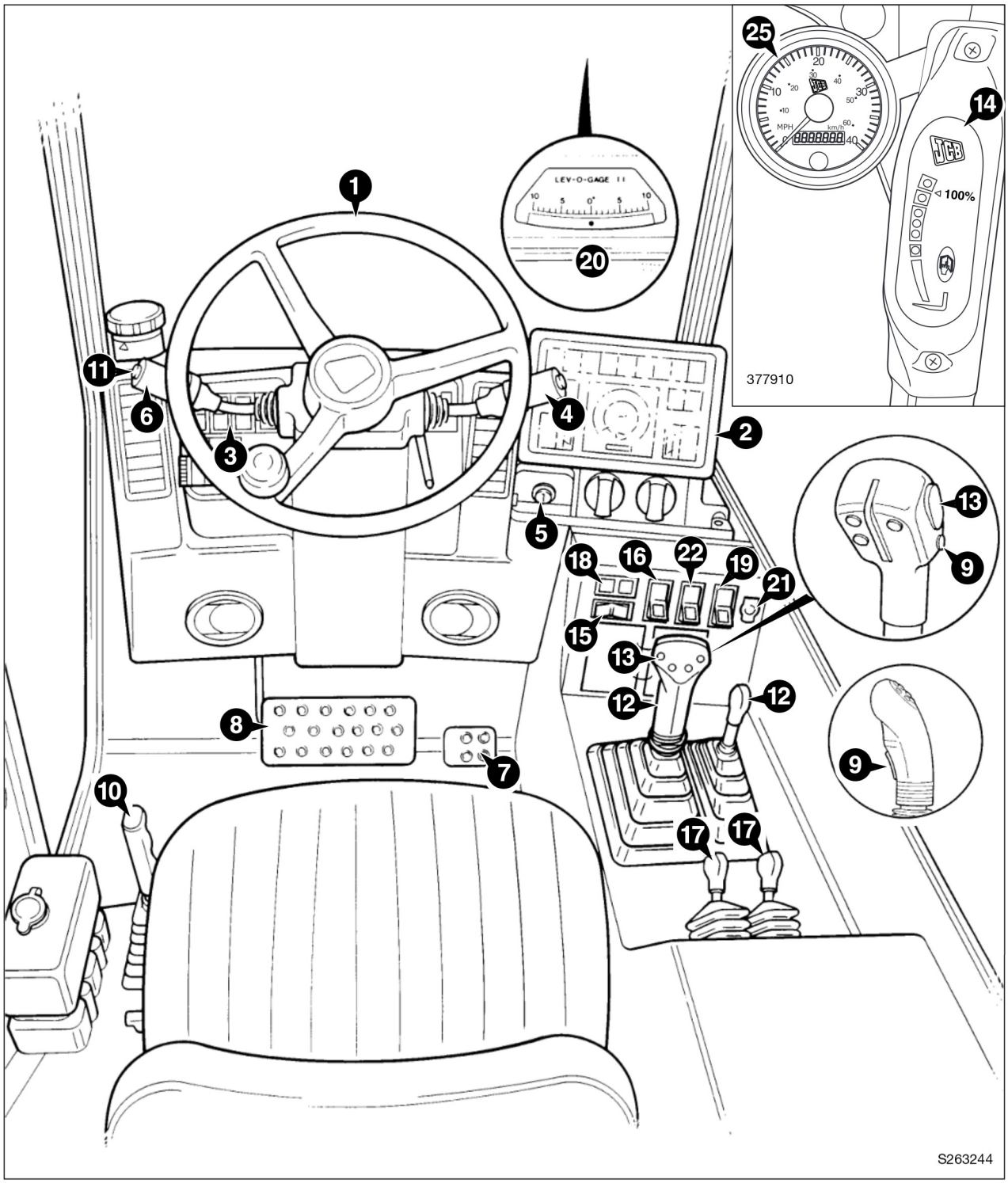
- **a** Hold buckle **B** as shown.
- **b** To make the strap longer, pull on the buckle.
- **c** To make the strap shorter, pull end **D**.

To adjust the male fitting:

- **a** Pull toggle **E** down the strap by the required distance.
- **b** To make the strap longer, pull end **F** as far as it will go.
- **c** To make the strap shorter, pull end **G** as far as it will go.



CAB LAYOUT AND CONTROLS



CAB LAYOUT AND CONTROLS (continued)

1 Steering Wheel

Turn the wheel in the direction you want to go. Note this machine is a four wheel steer machine.

2 Instrument Panel

*See **Cab Switches and Instruments** (OPERATION section).*

3 Instrument Panel Switches

*See **Cab Switches and Instruments** (OPERATION section).*

4 Steering Column Switch

*See **Cab Switches and Instruments** (OPERATION section).*

5 Starter Switch

*See **Cab Switches and Instruments** (OPERATION section).*

6 Gear Change Switch

*See **Getting the Machine Moving** (OPERATION section).*

7 Accelerator Pedal

Push this pedal down to increase engine speed. Let the pedal up to reduce engine speed. With your foot off the pedal the engine will idle.

8 Brake Pedal

Push down on the brake pedal to slow or stop the machine. Use the brakes to prevent overspeeding down a slope.

The stop lights should come on when the brakes are applied. Do not drive the machine unless both stop lights work correctly.

9 Transmission Dump Switch

You do not need to press the dump switch to change gear.

The dump switch can be used to momentarily dump the transmission pressure to improve the hydraulic performance and reduce engine load.

The position of switch **9** varies with machine. Check your machine.

10 Parking Brake Lever

⚠ CAUTION

The parking 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.
Whenever the parking brake has been used in an emergency, always renew both brake pads.
4-2-1-1/2

Use this lever to engage the parking brake before leaving the machine. With the parking brake engaged, an audible warning will sound and the Parking Brake Engaged indicator will light when the forward/reverse lever is moved away from neutral. *(See this page.)*

To engage the parking brake, pull the lever up as shown. To release the parking brake, simply lower the lever all the way.

To release the parking brake on machines fitted with a release lever under the hand grip, squeeze the release lever and lower the parking brake forward.

11 Forward/Reverse Lever

*See **Cab Switches and Instruments** (OPERATION section).*

12 Boom and Carriage Control Lever(s)

*See **Boom and Carriage Controls** (OPERATION section).*

13 Auxiliary Control Switch

*See **Boom and Carriage Controls** (OPERATION section).*

The position of switch **13** varies with machine. Check your machine.

14 Safe Load Indicator or Load Moment Indicator (LMI)

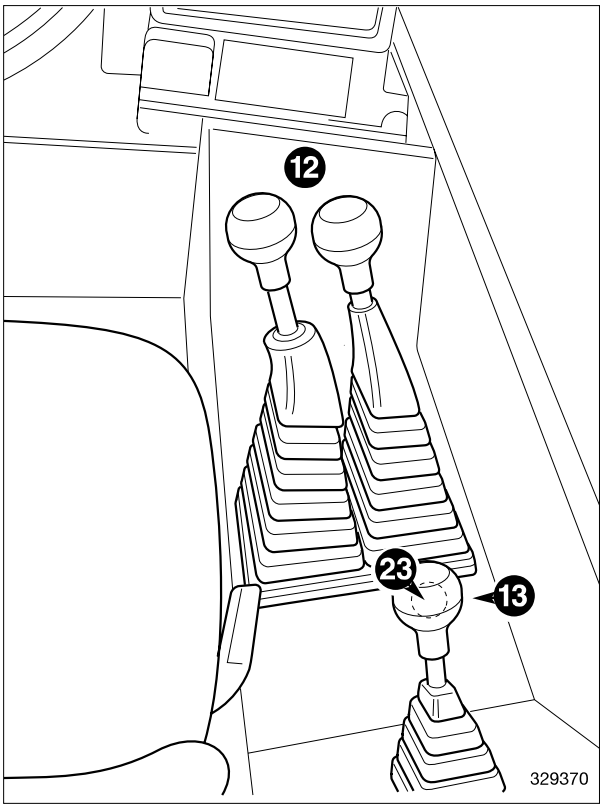
*See **Safe Load Indicator** or **Load Moment Indicator** (OPERATION section).*

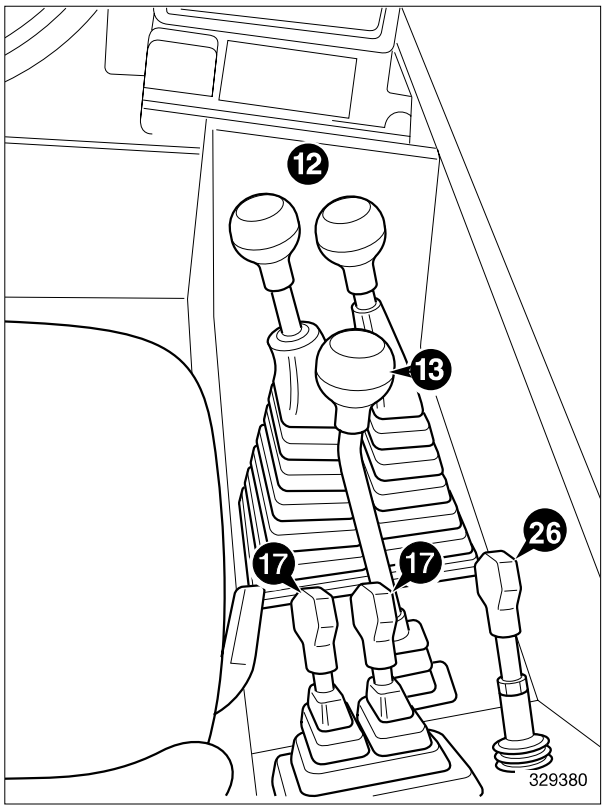
15 Sway Switch or Fan Reverse Switch

For sway switch, *see **Chassis Levelling (Sway) Option** (OPERATION section).*

For fan reverse switch, *see **Cab Switches and Instruments** (OPERATION section).*

CAB LAYOUT AND CONTROLS (continued)





16 Stabiliser Isolation Switch, Trailer Switch or Auxiliary Switch (530, 533, 535 & 540 only)

For stabiliser isolation switch, *see* ***Control Locks*** *(OPERATION section).* For trailer switch, *see* ***Mechanical Tow Hitch Option*** *or* ***Hydraulic Tow Hitch Option*** *(OPERATION section). For auxiliary switch, see* ***Boom and Carriage Controls*** *(OPERATION section).*

17 Stabiliser Control Levers

See ***Stabiliser Controls*** *(OPERATION section).*

18 Stabiliser Indicators (if fitted). Trailer Direction Indicators or Smooth Ride System Indicator.

See ***Stabiliser Controls*** *(OPERATION section).* For trailer direction indicators, *see* ***Mechanical Tow Hitch Option*** *or* ***Hydraulic Tow Hitch Option*** *(OPERATION section). For Smooth Ride System, see* ***Smooth Ride System*** *(OPERATION Section)*

19 Smooth Ride System Switch, or Inner Boom Extension Switch (540-170 only).

For Smooth Ride System, see ***Smooth Ride System*** *(OPERATION Section). For Inner Boom Extension Switch, see* ***Extend/Retract Boom*** *540-170 Machines (OPERATION Section).*

20 Inclinometer

Fitted to machines with Sway or Stabiliser Options. *See* ***Sway Control*** *or* ***Stabiliser Controls*** *(OPERATION section).*

21 Auxiliary Power Socket

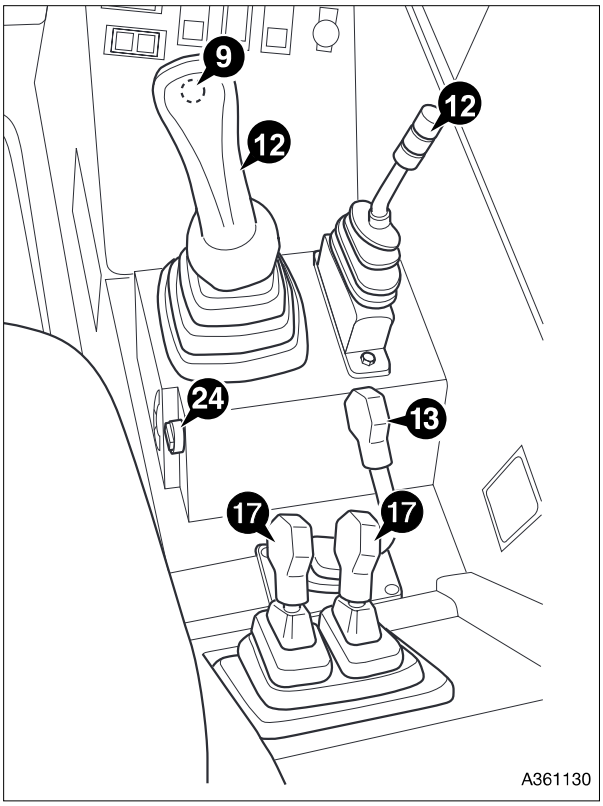
22 Joystick Isolation Switch (Not 540-170)

For Joystick Isolation Switch, *see* ***Control Locks*** *(OPERATION section).*

23 Aux 1/Aux 2 Selector Switch (530, 540 Only)

See ***Boom and Carriage Controls*** *(OPERATION section).*

CAB LAYOUT AND CONTROLS (continued)



24 Control Lever Locks (540-170 only)

*See **Control Locks** - Servo Control (OPERATION section).*

25 Speedometer (if fitted)

Indicates the machine speed in miles per hour (MPH) on the outer scale and in kilometres per hour (kph) on the inner scale. The digital readout shows total machine mileage.

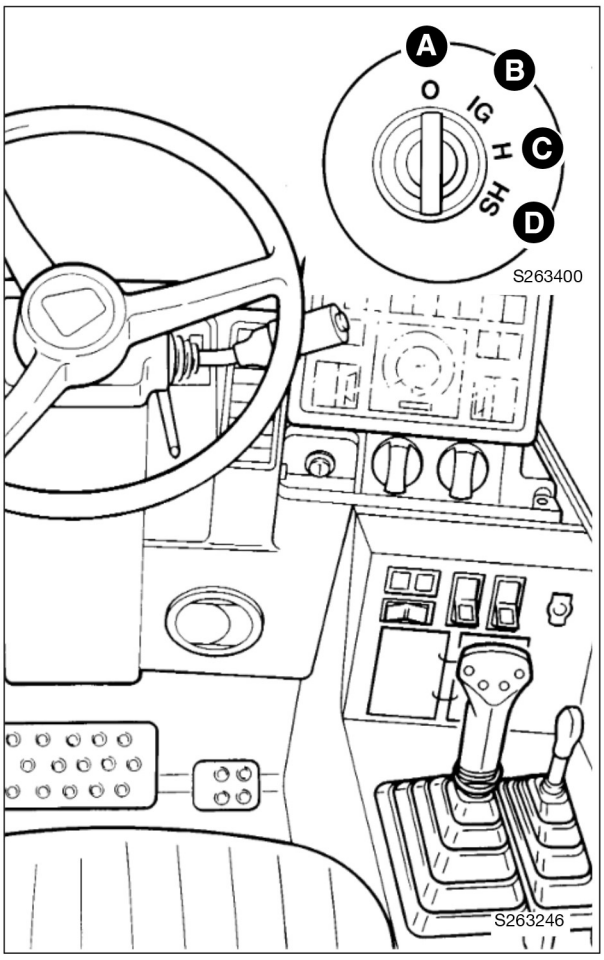
26 Steer Mode Selection Lever

Fitted to machines with manual steer mode selection. *See **Manual Steer Mode Selection** (OPERATION section).*

CAB SWITCHES AND INSTRUMENTS

Starter Switch

This is operated by the starter key. It has four positions. The key can be removed only with the switch set to off.



A Off/Stop Engine

Turning the key to this position will stop the engine. Make sure the transmission is in neutral, the boom has been retracted/lowered and the parking brake is engaged before stopping the engine.

B On

Putting the switch to this position connects the battery to all the electrical circuits except the lights and the hazard warning circuit. *(The lights and hazard warning circuits are permanently live.)* It also opens the fuel shut-off valve. The starter key will spring back to this position when it is released from positions **C** and **D**.

C Heat Position

Holding the key in the heat position warms the engine induction manifold for cold weather starting. Do not hold in this position for more than 15 seconds.

D Start position

Operates the starter motor to turn the engine.

***Note**: Do not operate the starter motor for more than 20 seconds at one time. Let the starter motor cool for at least two minutes between starts.*

CAB SWITCHES AND INSTRUMENTS (continued)

Steering Column Switches

1 Windscreen Wiper

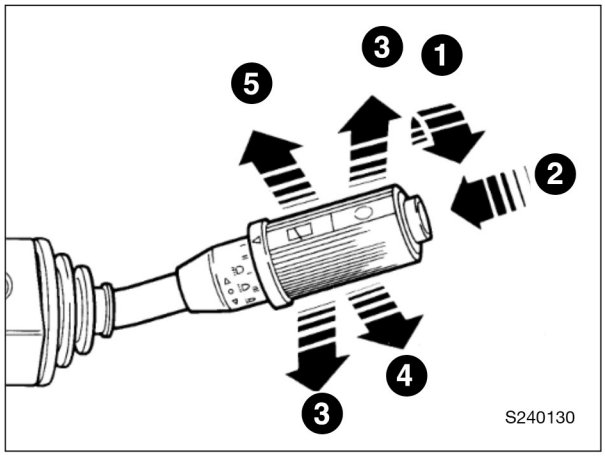
Rotate the barrel **1** as follows to switch the windscreen wiper on and off. Functions only with the starter switch set to on.

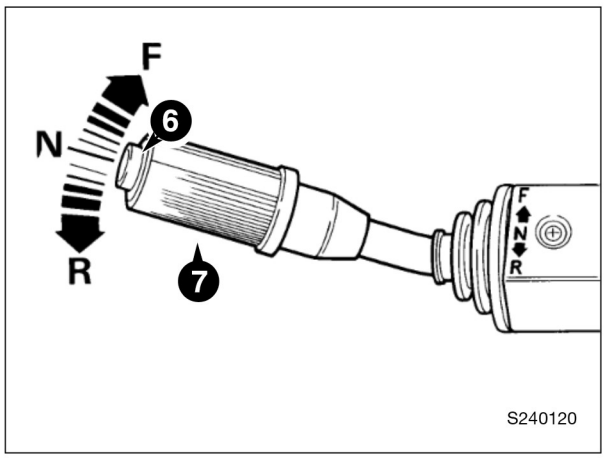
O Windscreen wiper off

I Windscreen wiper on

2 Windscreen Wash

Press button **2** to operate the windscreen washer. Functions only with the starter switch set to on.





3 Direction Indicators

Pull the lever towards you to indicate a right turn. Push the lever away from you to indicate a left turn. Switch the indicators off when you have completed the turn. Functions only with the starter switch set to on.

4 Headlights

With the side/headlights switched on, push the lever down (away from you) for main beam. Centre position is dipped beam.

5 Headlight Flash

Pull the lever towards the steering wheel to flash the headlights.

6 Horn (on Forward/Reverse Lever)

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.

7 Forward/Reverse Lever

⚠ WARNING

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

2-2-2-4

Stop the machine before moving this lever. To select forward, reverse or neutral, 'lift' and move the lever to the required position. All four gears are available in both forward and reverse. When reverse is selected an alarm will sound. The engine will only start if the lever is at neutral.

The lever has 'detent' positions in forward, reverse and neutral. To move the lever from the detent position pull the lever towards you.

Procedure for reversing direction:

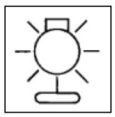
a Stop the machine: keep the foot brakes applied.
b Let the engine speed drop to idle.
c Select the new direction.
d Release the foot brakes and accelerate away.

If the parking brake is engaged when the forward/reverse lever is moved away from neutral an audible warning will sound and the *Parking Brake Engaged Indicator* will light.

CAB SWITCHES AND INSTRUMENTS (continued)

Instrument Panel Switches

Each switch has an insert with a graphic symbol, this symbol and the switch descriptions are detailed below.



Side Lights and Headlights
Rocker Switch. Press down for side lights only. Press further down for side lights and headlights.

⚠ WARNING

Do not drive on the road with the work lights switched on. You can dazzle other drivers and cause an accident.
2-2-2-5

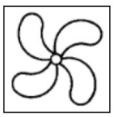
Working Lights
Rocker Switch. Press to switch on the work lights. The work lights will come on only after the side lights are switched on.

Warning Beacon
Rocker switch. Press to switch on the warning beacon when the beacon is plugged in, see ***Warning Beacon*** *in OPERATION section*.

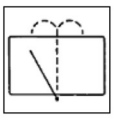
Hazard Warning Lights
Rocker switch. Press to switch on the hazard warning lights. A light on the instrument panel flashes with the outside lights.

Joystick Isolation
Rocker switch. Press to isolate the button functions on the joystick. *See* ***All Lever Lock*** *in OPERATION section*.

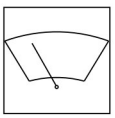
Inner Boom Extend/Retract (540-170 only)
Rocker switch. Press to activate the inner boom section. *See* ***Boom And Carriage Controls*** *in OPERATION section*.



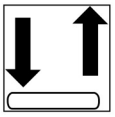
Heater Fan
See ***Heater*** *(OPERATION section)*.



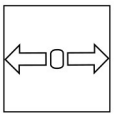
Rear Wiper
Rocker switch. Press to switch on the rear wiper. Functions only with the starter switch set to on.



Roof Wiper
Rocker switch. Press down to switch on the roof wiper. Press further down for the washers. Functions only with the starter switch set to on.

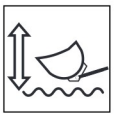


Trailer Hitch
See ***Trailer Pickup Hitch and Tow Hitch*** *in OPERATION section.*

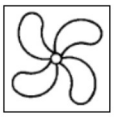


Trailer Direction Indicator Lights
See ***Trailer Pickup Hitch and Tow Hitch*** *in OPERATION section.*

Air Conditioning (if fitted)
See ***Air Conditioning*** *in OPERATION section.*



Smooth Ride System (if fitted)
Fully lower the boom. Press fully down to switch on Smooth Ride System. The switch will spring back to the ON position. An indicator lamp illuminates when the system is activated. *See* ***Smooth Ride System*** *in OPERATION section.*



Fan Reverse (if fitted)
Press down to reverse the cooling fan. If necessary, increase engine speed whilst the fan is reversed to help to clear grilles. Release to revert to normal operation.

Note: *To avoid damage to the machine, make sure that the engine is at less than 1000rpm before changing the direction of the fan.* ***ALWAYS*** *reduce engine speed before releasing the switch.*

CAB SWITCHES AND INSTRUMENTS (continued)

Steer Mode Selector

The selector is a three-position rotary switch **A**, which is equipped with a hinged lockplate **B**. This enables the selector switch to be locked into the 2-wheel steer mode when the machine is driven on public highways. Use the selector switch to select the mode of steering which is most suitable for the terrain and the work you are doing. Indicator lights on the instrument panel tell you what steer mode the machine is in.

IMPORTANT: Never change from 4-wheel steer to crab steer (or vice versa) without first selecting 2-wheel steer for approximately 5 seconds.

C 4-Wheel Steer **D** 2-Wheel Steer **E** Crab Steer

Sensors on the axles prevent the steer mode from changing until all wheels straighten up or pass through the 'straight ahead' position. Because of this, there will be a short period when the indicator lights do not agree with the switch position.

If you have any doubt about what steer mode the machine is in, always remember that it is the indicator light which is correct.

Phasing 4 Wheel Steer

⚠ WARNING

Failure to phase 4-wheel steer at least once per day may mean a reduction in steering effectiveness.
5-2-1-6

At the start of each working period and at least once per day or when having difficulty in steering do the following:

1 Select 2-wheel steer, the indicator lights will still show 4-wheel steer.

2 Operate the machine until the rear wheels straighten up. When the rear wheels straighten up the machine will go into 2-wheel steer. The indicator lights will show when 2-wheel steer has engaged.

3 Select 4-wheel steer again. The front and rear wheels are now back in phase.

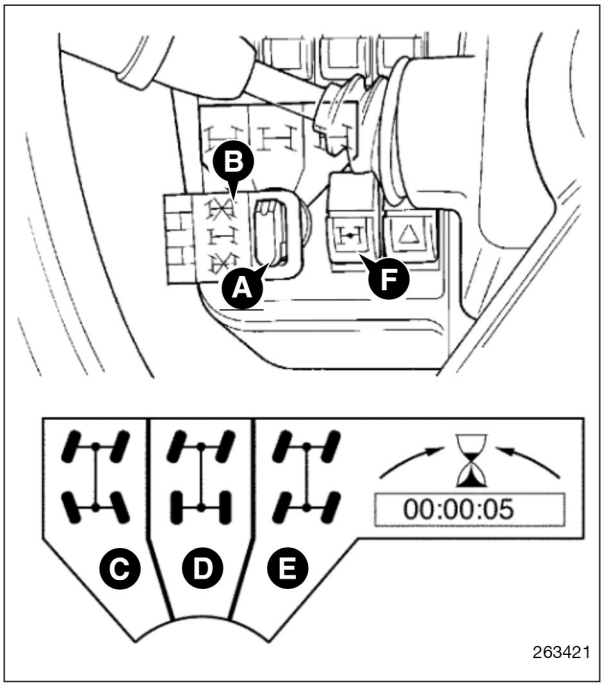
Four Wheel Drive Disconnect Switch Option

Use 2-wheel drive where possible, only select 4-wheel drive on soft uneven ground when traction is limited.

For towing, *see* ***Mechanical Tow Hitch, Hydraulic Tow Hitch Options*** *(this section).*

1 Press switch **F** to disengage 4-wheel drive. The switch will illuminate when 2-wheel drive is selected.

Note: When the brake pedal is pressed the machine will automatically go into 4-wheel drive and the indicator light will go out.



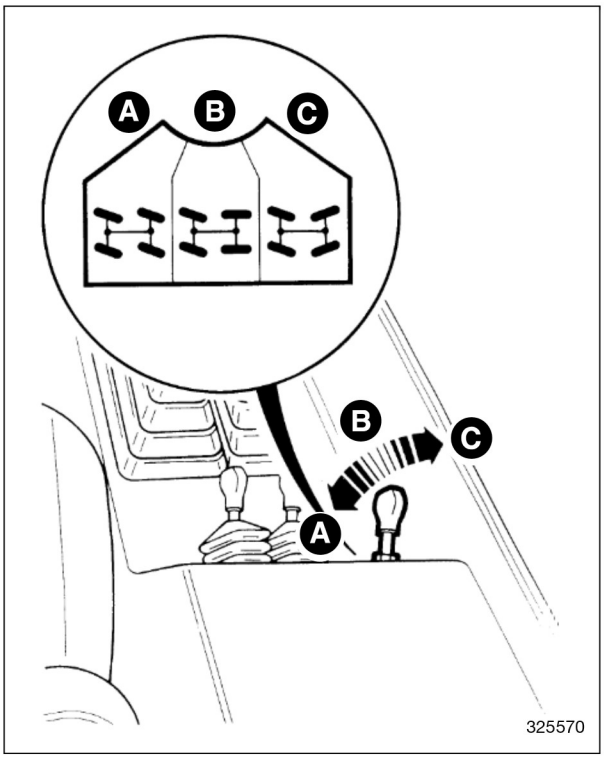
CAB SWITCHES AND INSTRUMENTS (continued)

Manual Steer Mode Selection

⚠ WARNING

Over a long period of time, the front and rear axles may get slightly out of phase. At the start of each working period, before travelling on public roads and at least once a day, or if having difficulty in steering, check and, if necessary, re-align the road wheels. Failure to re-align the road wheels at least once per day may mean a reduction in steering effectiveness. This can lead to tyre scuffing and difficulty in steering a straight line.

5-2-6-4



Some machines may be fitted with a manual steer mode selection control. At the start of each working period, and at least once per day or when having difficulty in steering do the following:

1 Stop the machine. Select the neutral position on the forward reverse lever.

2 Select four-wheel steering **A**. Turn the steering wheel until the rear wheels are pointing in the straight ahead position.

3 Select two-wheel steering **B**. Turn the steering wheel until the front wheels are pointing in the straight ahead position.

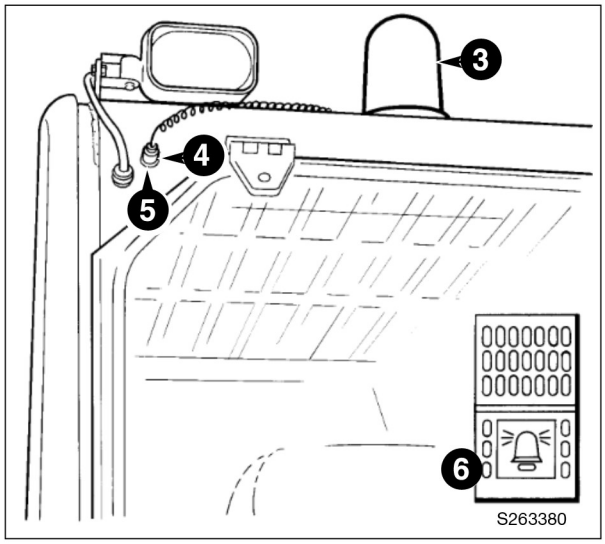
4 All wheels are now pointing straight ahead, select the steer mode required and continue in the normal manner.

CAB SWITCHES AND INSTRUMENTS (continued)

Warning Beacon

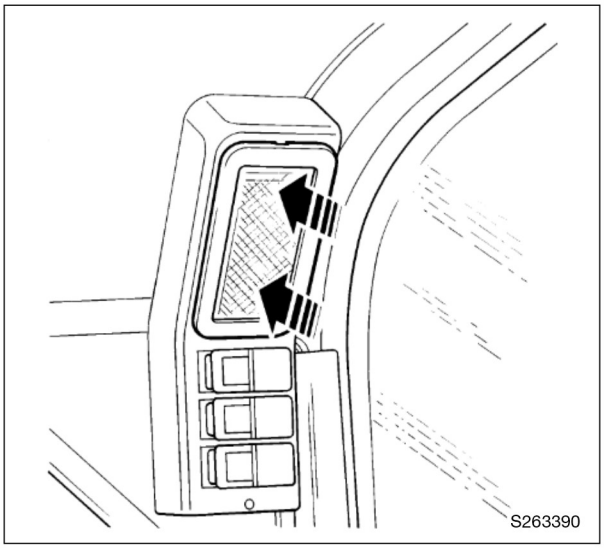
It is a legal requirement in certain countries for the machine to have a warning beacon operating on some public roads. A yellow or amber warning beacon kit is available as an option.

The beacon **3** has a magnetic base for mounting on the roof. The beacon's plug **4** connects into a socket **5** in the cab. Switch the beacon on by pressing switch **6**. An indicator light in the switch lights when the beacon is operating.



Cab Light

Press either end of the light unit to switch it on. Pressing the other end to make the light unit flush with the housing will switch it off.



CAB SWITCHES AND INSTRUMENTS (continued)

Instruments

The instruments and indicator lights are grouped together on an instrument panel. Instruments provided are a tachometer/speedometer/hourmeter, a coolant temperature gauge and a fuel level gauge.

As well as indicator lights for the direction indicators, main beam etc. there are warning lights for various fault conditions. When a warning light comes on an alarm will sound. The only way to cancel the alarm is to set the starter to 'off'.

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

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

1 Coolant Temperature Gauge

Indicates the temperature of the engine coolant. The gauge pointer will gradually swing upwards as the coolant temperature rises.

Note: The machine can be operated until the red warning light illuminates then stop the engine. *See **Warnings (Audible/Visual)** this section.*

2 Fuel Level Gauge

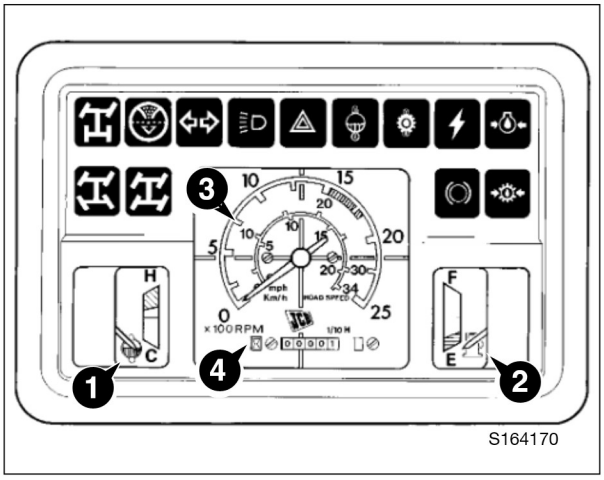
Indicates the level of diesel fuel in the tank. *See **Fuel System** in MAINTENANCE section* for the type of fuel to be used. Do not let the tank run dry, or air will enter the fuel system.

3 Tachometer

Indicates the engine speed in revolutions per minute (**RPM**). The RPM is shown on the outer ring. Each division is 100 RPM. A green band on the scale indicates the RPM which gives best fuel economy. Operate within that band whenever possible.

4 Hourmeter

Records the total running time of the engine. Use it to keep a check of running hours during maintenance intervals.



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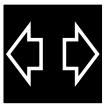
CAB SWITCHES AND INSTRUMENTS (continued)

Warnings (Visual only)



Direction Indicators On - *Green Flashing Light*
Flashes with the left and right direction indicators. Use the direction indicators to signal before turning the machine.

Main Beam On - *Blue Light*
Lights when the headlight main beams are switched on. Switch the main beam off for oncoming vehicles.

Hazard Warning Lights On - *Red Flashing Light*
Flashes with the hazard warning lights *(even with the starter switch at 'off').*

4-Wheel Steer Engaged - *Red Light*
Lights when 4-wheel steer mode is engaged. Note that the light may sometimes temporarily disagree with the position of the steer mode selector *(see **Steer Mode Selector** in OPERATION section).*

Crab Steer Engaged - *Red Light*
Lights when crab steer mode is engaged. Note that the light may sometimes temporarily disagree with the position of the steer mode selector *(see **Steer Mode Selector** in OPERATION section).*

2-Wheel Steer Engaged - *Red Light*
Lights when 2-wheel steer mode is engaged. Note that the light may sometimes temporarily disagree with the position of the steer mode selector *(see **Steer Mode Selector** in OPERATION section).*

Warnings (Audible/Visual) - *Red Light and Audible Alarm*

⚠ CAUTION

If any of the audible/visual warnings operate whilst the engine is running, stop the engine as soon as it is safe to do so and rectify the fault.
4-2-1-2

Air Filter Blocked
Lights if the engine air filter blocks up.*(See **Engine Air Filter** in MAINTENANCE section.)*

Engine Coolant Temperature High
Lights if the engine coolant temperature rises too far. The engine cooling fan is driven by a hydraulic motor.

Transmission Oil Temperature High
Lights if the transmission oil temperature rises too far.

No Charge
Lights if the battery charging circuit fails while the engine is running. The light should go out a few seconds after the engine is started.

Engine Oil Pressure Low
Lights if the engine oil pressure falls too far. The light should go out a few seconds after the engine is started.

Parking Brake Engaged
Lights if Forward or Reverse drive is selected while the parking brake is engaged.

Transmission Oil Pressure Low
Lights if the transmission oil pressure falls too far. The light should go out a few seconds after the engine is started.

HEATER & AIR CONDITIONING

Heater

Heated or unheated air is provided from a heater unit which includes a two-speed fan. Air can be drawn in from the outside or recirculated inside the cab. The air can be directed to the windscreen and/or the cab interior.

Heater On-Off

Turn knob **A** in direction **B** to increase the temperature. To reduce the temperature turn in direction **C**.

Fresh or Recirculated Air

Turn knob **D** to **E** for fresh air. To recirculate select **F**.

Cab/Windscreen Heating

Position vents **G** and **H** as required to direct air.

Heater Fan

Press to switch **J** to turn the heater fan on. Press further for fast speed. Functions only with the starter switch set to on.

Air Conditioning Option

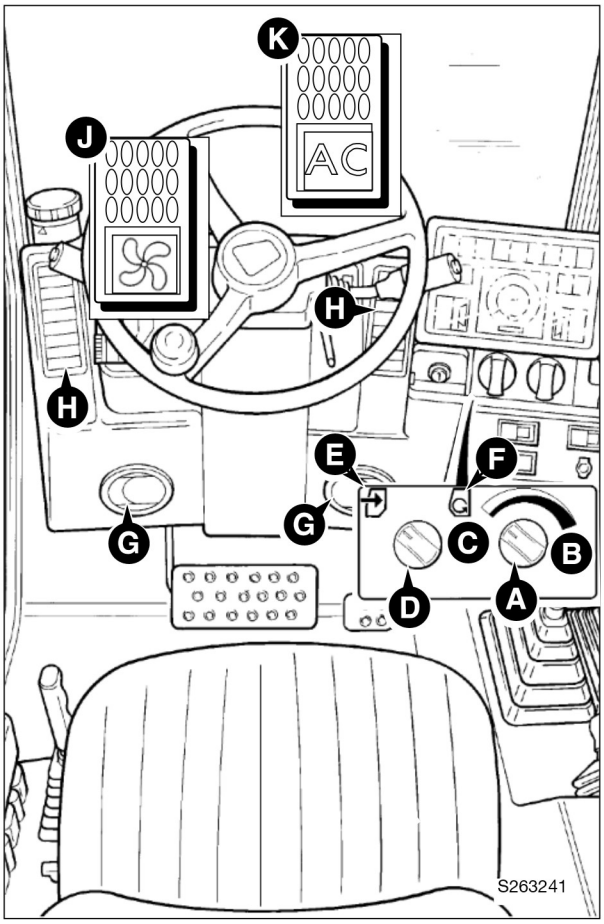
To provide cool air in warm climates and during hot seasons the air conditioning system delivers cool dehumidified air into the cab.

Before starting the engine make sure the air conditioning is switched off.

Press down switch **K** to turn the air conditioning on.

Operate the heater controls as previously described for operator comfort.

***Note**: In dusty conditions it is recommended that air is recirculated within the cab, otherwise the filter may become clogged.*



BOOM AND CARRIAGE CONTROLS

Introduction

⚠ WARNING

Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.
5-2-2-9

Control levers and switches may vary on machines. The machine may be fitted with any of the following control layouts.

(a) Single lever control.
(b) Dual lever control with loading and placing control pattern options.
(c) Dual lever control with loading and placing pattern options and manual auxiliary control levers.
(d) Servo controls for 540-170 machines only.

Decals near the levers and switches show by symbols, which levers and switches cause what actions. Before operating control levers and switches, check the decal to make sure you select the desired action.

The following pages describe the operation of the various control patterns.

BOOM AND CARRIAGE CONTROLS
Single Lever Control

Raise Boom/Lower Boom

⚠ WARNING

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab
INT-2-1-3

⚠ WARNING

Operating the boom while travelling can cause accidents. You will not have total control of the machine. Never operate the boom while travelling.
5-1-5-2

⚠ DANGER

You can be electrocuted if you get your machine too close to live electrical power lines. Before starting work, find out if there are electrical power lines on the jobsite. If there are, contact the local electricity supplier and ask what safety precautions you must take. Also find out if there are any local laws and regulations concerned with work near electrical power lines.

When you have found out what safety precautions, laws and regulations apply to the jobsite, make sure they are all obeyed.
5-1-5-6

⚠ WARNING

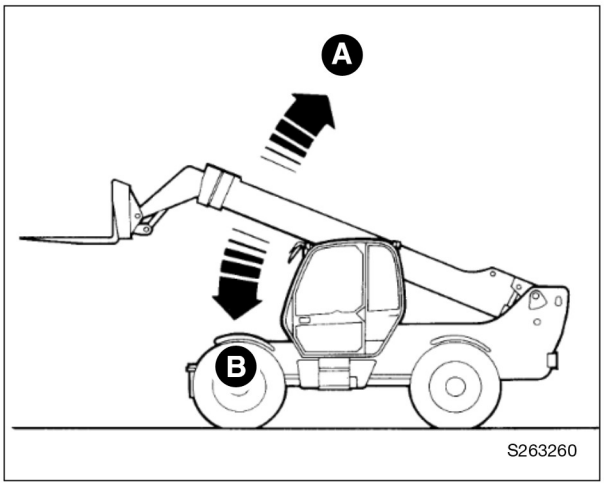
Make sure it is clear overhead before raising the boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.
5-2-1-5/1

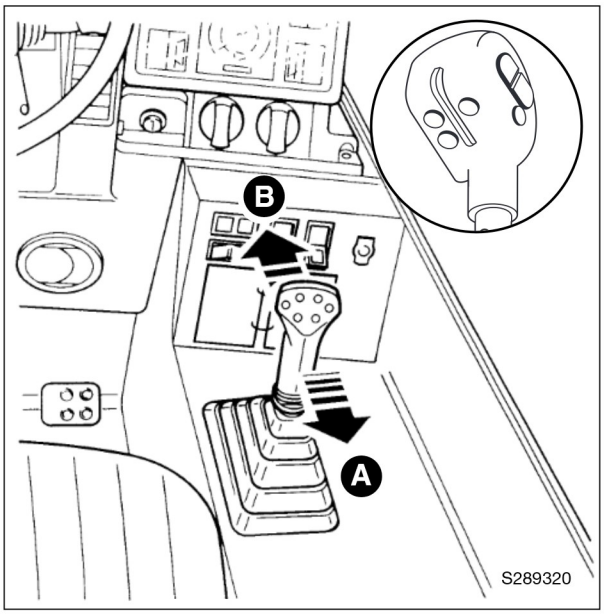
⚠ WARNING

Release the boom raise lever as soon as the boom is fully raised. Holding the control in the lift position can result in the carriage slowly crowding back.
5-2-1-11

The levers are spring-loaded to their central hold positions. The speed of movement of the associated hydraulic rams depends on how far you move a lever - the further you move the lever, the faster the ram action.

The rams will stay in any position until you move them with the levers or switches.





A Raise Boom
B Lower Boom

BOOM AND CARRIAGE CONTROLS
Single Lever Control

Extend Boom/Retract Boom

⚠ WARNING

Make sure it is clear overhead before extending a raised boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.

5-2-2-1/1

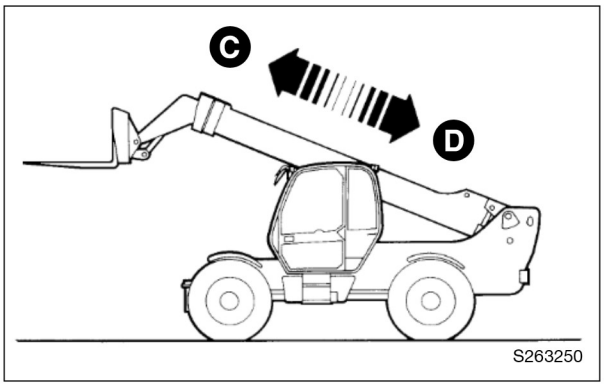
⚠ WARNING

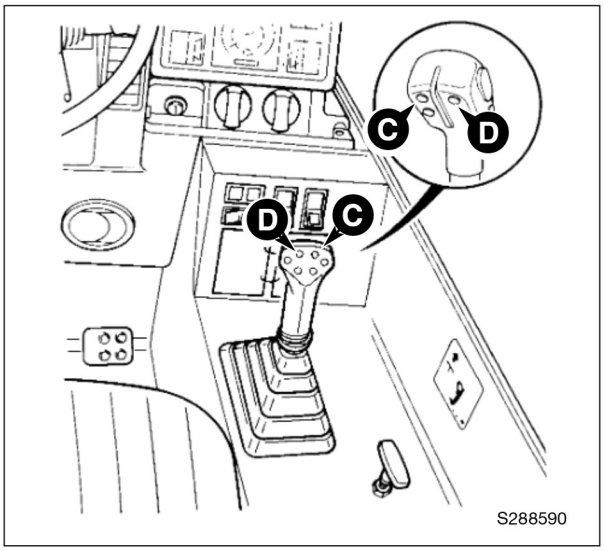
Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.

5-2-2-9

Note: Three stage booms can go out of phase if the hydraulic cylinders are not **fully** retracted regularly. Fully retract the boom at least once every day.

To re-phase the boom sections - hold the control in the retract position with the engine at high idle speed until the boom sections are fully retracted.



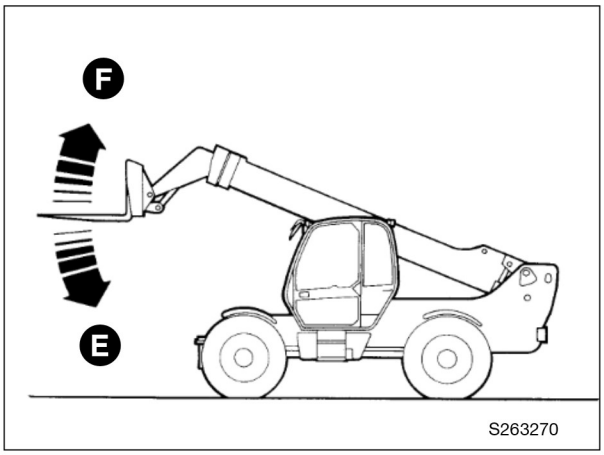


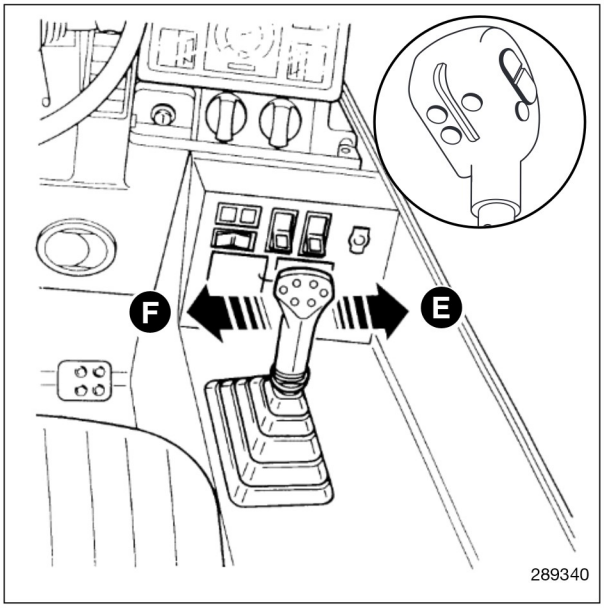
C Extend Boom
D Retract Boom

BOOM AND CARRIAGE CONTROLS
Single Lever Control

Tilt Carriage Forward/Back

E Forward.
F Back.





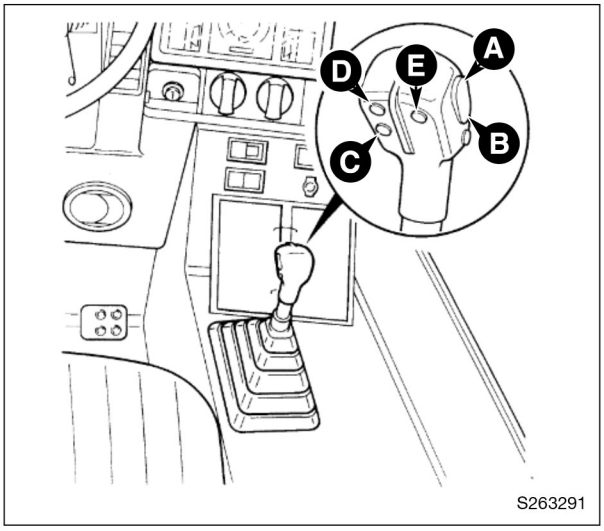
BOOM AND CARRIAGE CONTROLS
Single Lever Control

Auxiliary Operation

Note: *To fit an attachment, see* ***INSTALLING AND REMOVING Q-FIT ATTACHMENTS*** *(OPTIONAL ATTACHMENTS section).*

⚠ WARNING

Before operating the Auxiliary control system make sure that you are aware of all WARNINGS and CAUTIONS that apply to the attachment you are using. Also make sure you have fitted the attachment correctly. (see OPTIONAL ATTACHMENT section).
5-2-2-6



AUXILIARY 1 - A or **B** depending on the attachment fitted and the function required.

AUXILIARY 2 - Hold **C** in then **A** or **B** depending on the attachment fitted and the function required.

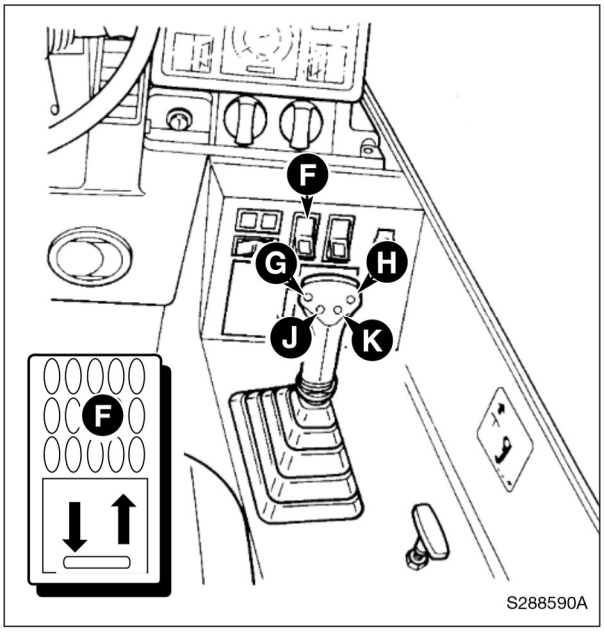
Buttons **D** and **E** are not fitted on all machines.

Hitch Switch or Auxiliary Switch (if fitted)
The machine is fitted with one auxiliary circuit (AUX 1). A second auxiliary circuit (AUX 2) is available as an option. An optional trailer pickup hitch, trailer brakes and trailer tip circuit is also available. In all cases there is only one auxiliary switch; selection of AUX 2 and the trailer circuits is made by means of switches.

AUX 1 - Ensure the Hitch/Auxiliary selector switch **F**, if fitted, is set to **ON**, the switch light is illuminated. Press **G** or **H** depending on the attachment fitted and the function required.

AUX 2 - Ensure the Hitch/Auxiliary selector switch **F**, if fitted, is set to **ON**, the switch light is illuminated. Press **J** or **K** depending on the attachment fitted and the function required.

HITCH OPERATION - *See* ***Hydraulic Tow Hitch Option*** *in OPERATION Section.*



BOOM AND CARRIAGE CONTROLS
Single Lever Control

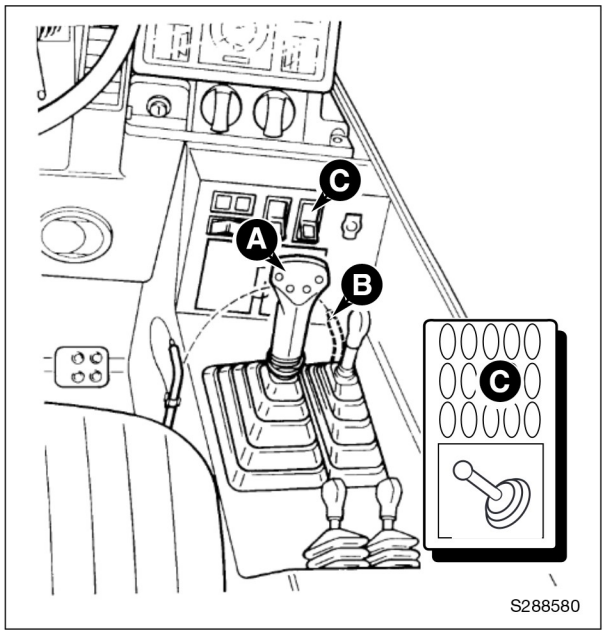
Control Locks

The requirement for control lever lock/isolation varies according to local legislation. You must comply with local legislation at all times. The locks/switches are designed to lock or isolate the control(s) in the neutral position. Refer to the illustration applicable to your machine

All Lever Lock

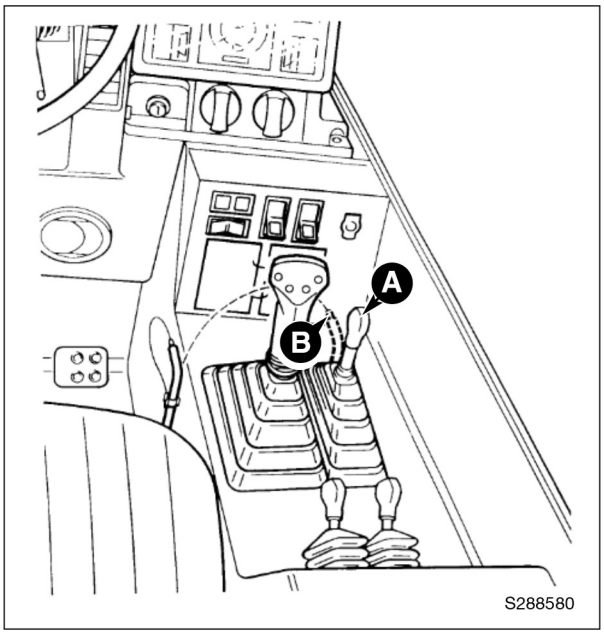
Lock all the controls before travelling on public roads. To lock the controls, ensure the lever **A** is in the neutral position, then press down pin **B** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.

Isolate the joystick button functions before travelling on public roads. To isolate the buttons, operate the Joystick Isolation Switch **C** .



Tilt Lever Lock

This lock MUST be fitted when using a platform, *see **Working with a Platform** (this section).* To lock the controls ensure the lever **A** is in the neutral position, then press down pin **B** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.



BOOM AND CARRIAGE CONTROLS
Dual Lever Control

Raise Boom/Lower Boom

⚠ WARNING

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab
INT-2-1-3

⚠ WARNING

Operating the boom while travelling can cause accidents. You will not have total control of the machine. Never operate the boom while travelling.
5-1-5-2

⚠ DANGER

You can be electrocuted if you get your machine too close to live electrical power lines. Before starting work, find out if there are electrical power lines on the jobsite. If there are, contact the local electricity supplier and ask what safety precautions you must take. Also find out if there are any local laws and regulations concerned with work near electrical power lines.

When you have found out what safety precautions, laws and regulations apply to the jobsite, make sure they are all obeyed.
5-1-5-6

⚠ WARNING

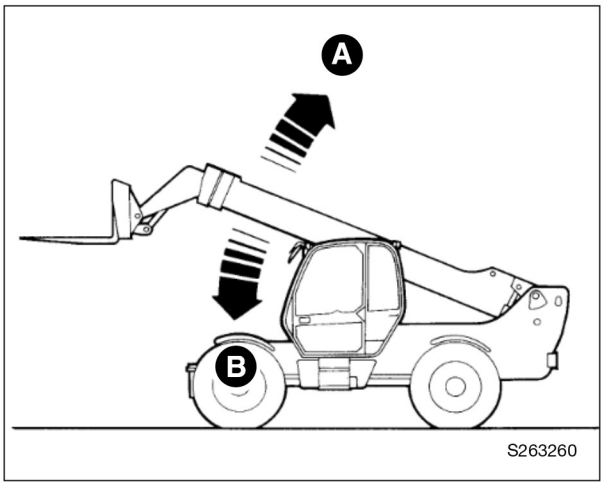
Make sure it is clear overhead before raising the boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.
5-2-1-5/1

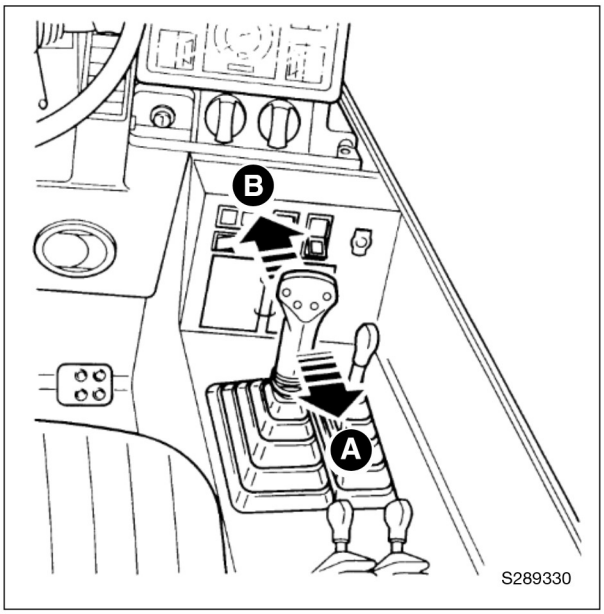
⚠ WARNING

Release the boom raise lever as soon as the boom is fully raised. Holding the control in the lift position can result in the carriage slowly crowding back.
5-2-1-11

The levers are spring-loaded to their central hold positions. The speed of movement of the associated hydraulic rams depends on how far you move a lever - the further you move the lever, the faster the ram action.

The rams will stay in any position until you move them with the levers or switches.





A Raise Boom
B Lower Boom

BOOM AND CARRIAGE CONTROLS
Dual Lever Control

Extend Boom/Retract Boom

⚠ WARNING

Make sure it is clear overhead before extending a raised boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.

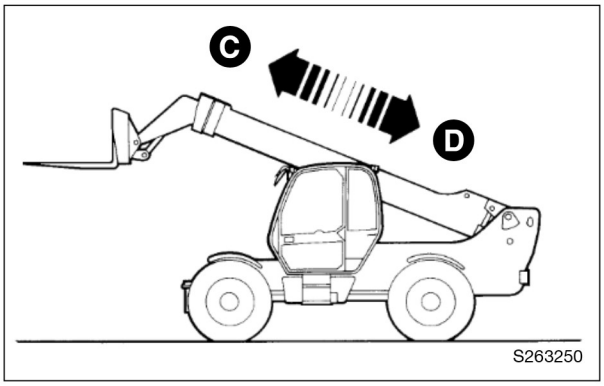
5-2-2-1/1

⚠ WARNING

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

5-2-2-9

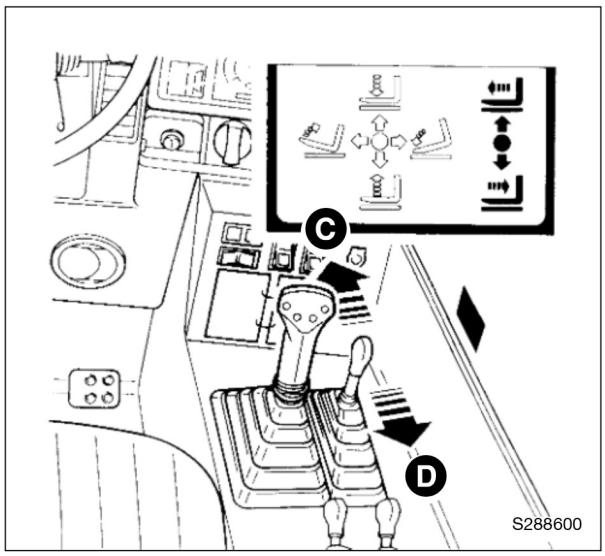
C Extend Boom
D Retract Boom



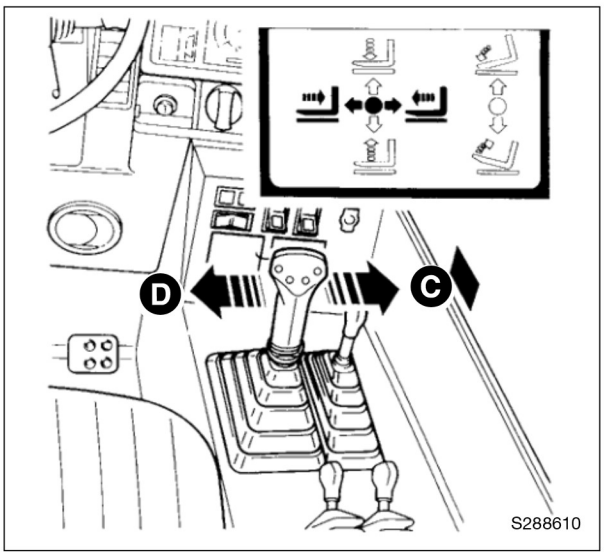
Note: Three stage booms can go out of phase if the hydraulic cylinders are not **fully** retracted regularly. Fully retract the boom at least once every day.

To re-phase the boom sections - hold the control in the retract position with the engine at high idle speed until the boom sections are fully retracted.

Loading Pattern



Placing Pattern



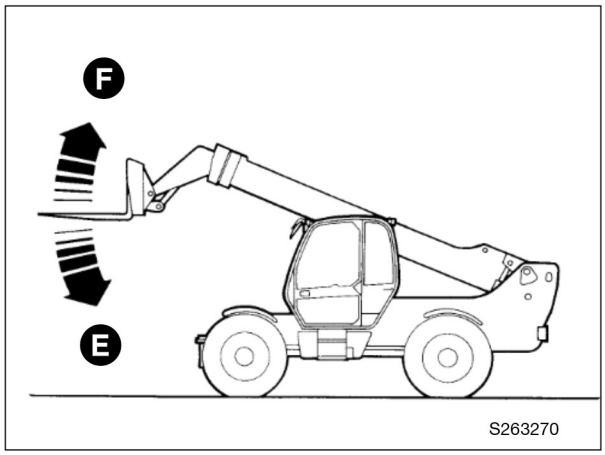
BOOM AND CARRIAGE CONTROLS
Dual Lever Control

Tilt Carriage Forward/Back

⚠ WARNING

Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.
5-2-2-9

E Forward.
F Back.



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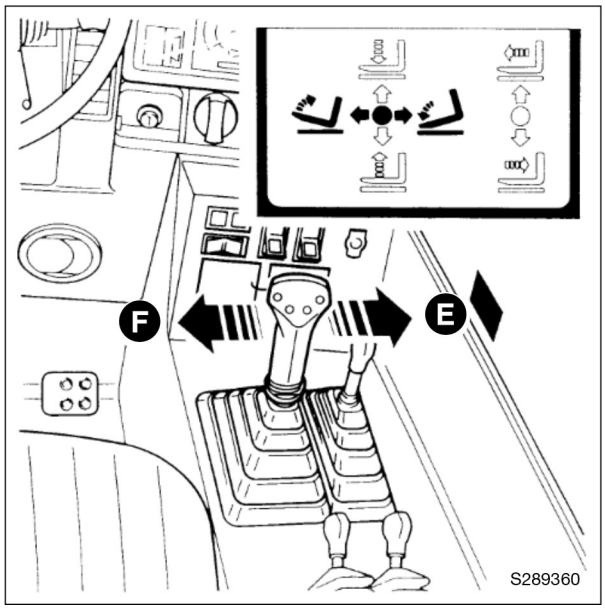
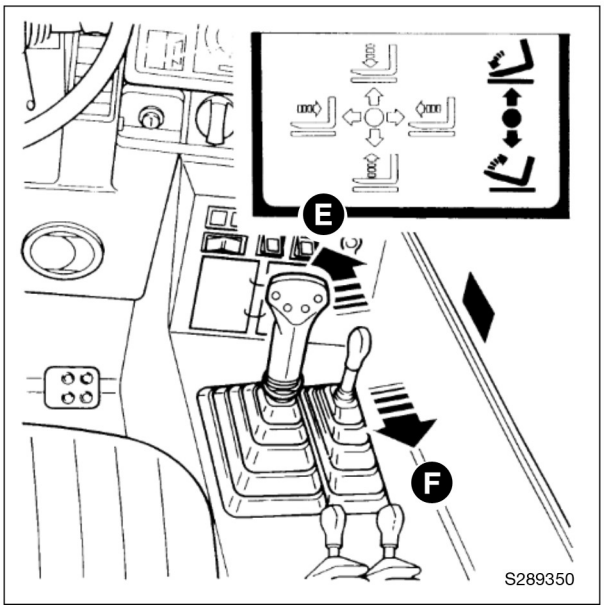


Placing Pattern



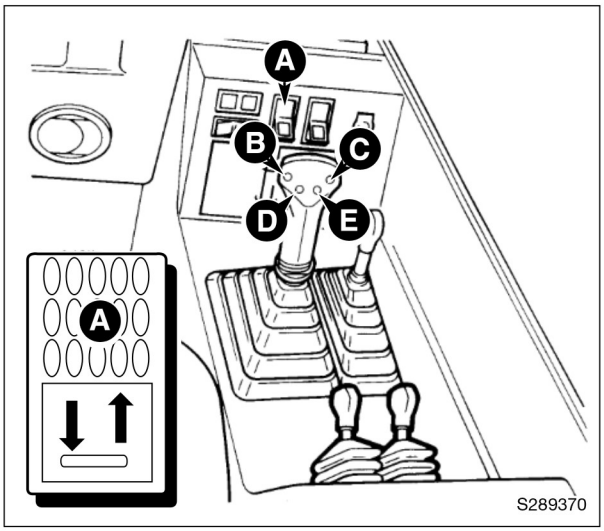
BOOM AND CARRIAGE CONTROLS
Dual Lever Control

Auxiliary Operation

Note: *To fit an attachment, see* ***INSTALLING AND REMOVING Q-FIT ATTACHMENTS*** *(OPTIONAL ATTACHMENTS section).*

⚠ WARNING

Before operating the Auxiliary control system make sure that you are aware of all WARNINGS and CAUTIONS that apply to the attachment you are using. Also make sure you have fitted the attachment correctly. (see OPTIONAL ATTACHMENT section).
5-2-2-6



Hitch Switch or Auxiliary Switch (If fitted)
The machine is fitted with one auxiliary circuit (AUX 1). A second auxiliary circuit (AUX 2) is available as an option. An optional trailer pickup hitch, trailer brakes and trailer tip circuit is also available. In all cases there is only one auxiliary switch; selection of AUX 2 and the trailer circuits is made by means of switches.

AUX 1 - Ensure the Hitch/Auxiliary selector switch **A**, if fitted, is set to **ON**, the switch light is illuminated. Press **B** or **C** depending on the attachment fitted and the function required.

AUX 2 - Ensure the Hitch/Auxiliary selector switch **A**, if fitted, is set to **ON**, the switch light is illuminated. Press **D** or **E** depending on the attachment fitted and the function required.

HITCH OPERATION - *See* ***Hydraulic Tow Hitch Option*** *in OPERATION Section.*

BOOM AND CARRIAGE CONTROLS
Dual Lever Control

Control Locks

The requirement for control lever lock/isolation varies according to local legislation. You must comply with local legislation at all times. The locks/switches are designed to lock or isolate the control(s) in the neutral position. Refer to the illustration applicable to your machine

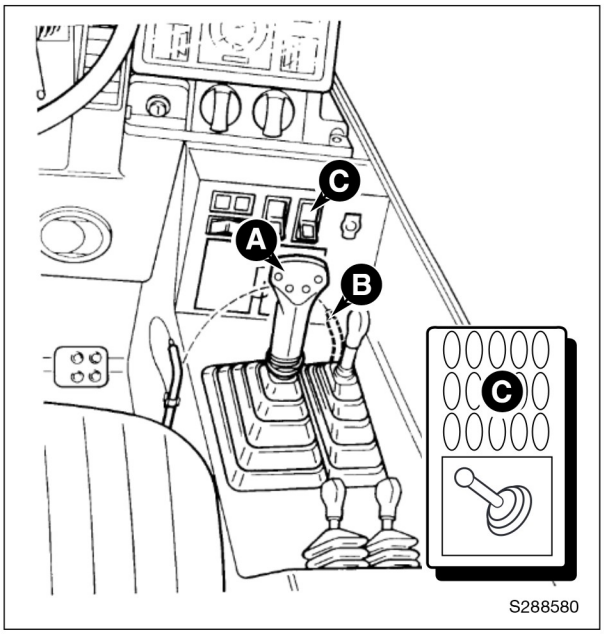
All Lever Lock

Lock all the controls before travelling on public roads. To lock the controls, ensure the lever **A** is in the neutral position, then press down pin **B** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.

Isolate the joystick button functions before travelling on public roads. To isolate the buttons, operate the Joystick Isolation Switch **C** .

Tilt Lever Lock

This lock MUST be fitted when using a platform, *see **Working with a Platform** (this section).* To lock the controls ensure the tilt lever is in the neutral position, then press down pin **B** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.



BOOM AND CARRIAGE CONTROLS
Manual Auxiliary Control

Raise Boom/Lower Boom

⚠ WARNING

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab
INT-2-1-3

⚠ WARNING

Operating the boom while travelling can cause accidents. You will not have total control of the machine. Never operate the boom while travelling.
5-1-5-2

⚠ DANGER

You can be electrocuted if you get your machine too close to live electrical power lines. Before starting work, find out if there are electrical power lines on the jobsite. If there are, contact the local electricity supplier and ask what safety precautions you must take. Also find out if there are any local laws and regulations concerned with work near electrical power lines.

When you have found out what safety precautions, laws and regulations apply to the jobsite, make sure they are all obeyed.
5-1-5-6

⚠ WARNING

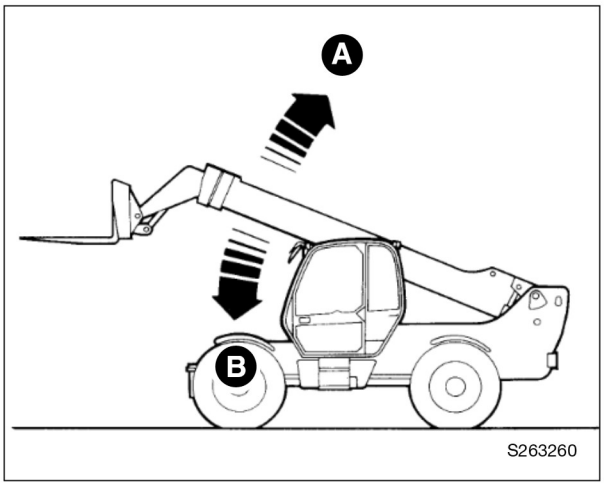
Make sure it is clear overhead before raising the boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.
5-2-1-5/1

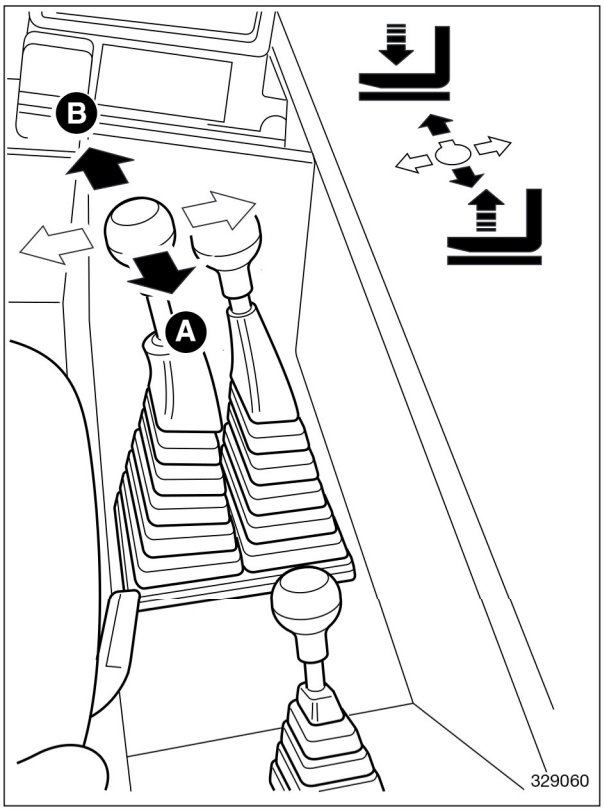
⚠ WARNING

Release the boom raise lever as soon as the boom is fully raised. Holding the control in the lift position can result in the carriage slowly crowding back.
5-2-1-11

The levers are spring-loaded to their central hold positions. The speed of movement of the associated hydraulic rams depends on how far you move a lever - the further you move the lever, the faster the ram action.

The rams will stay in any position until you move them with the levers or switches.





A Raise Boom
B Lower Boom

BOOM AND CARRIAGE CONTROLS
Manual Auxiliary Control

Extend Boom/Retract Boom

⚠ WARNING

Make sure it is clear overhead before extending a raised boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.

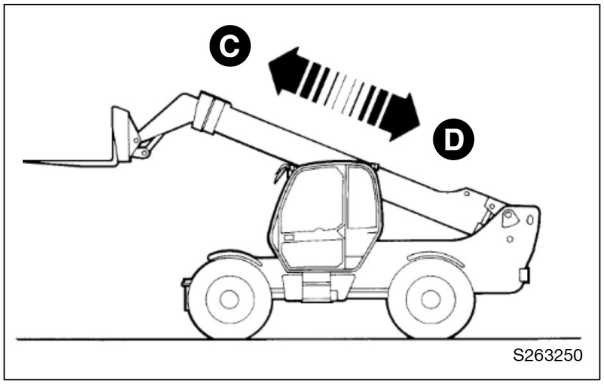
5-2-2-1/1

⚠ WARNING

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

5-2-2-9

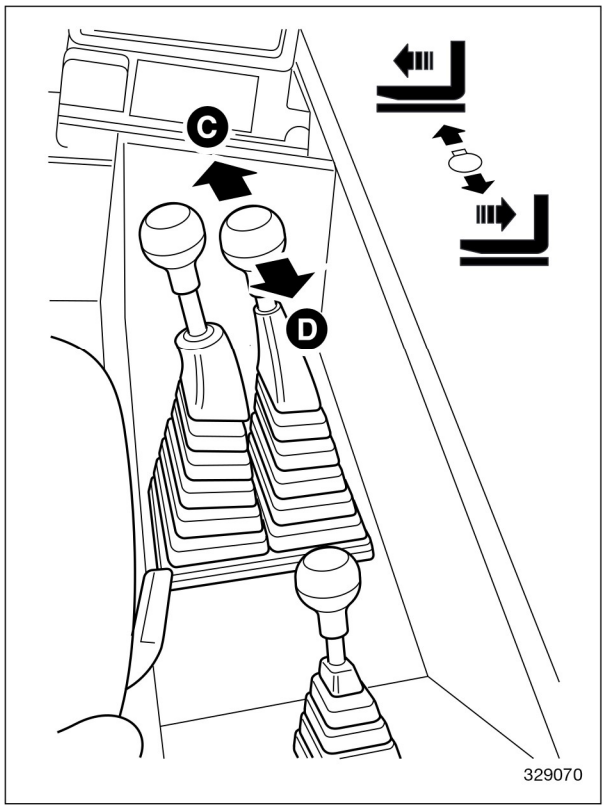
C Extend Boom
D Retract Boom



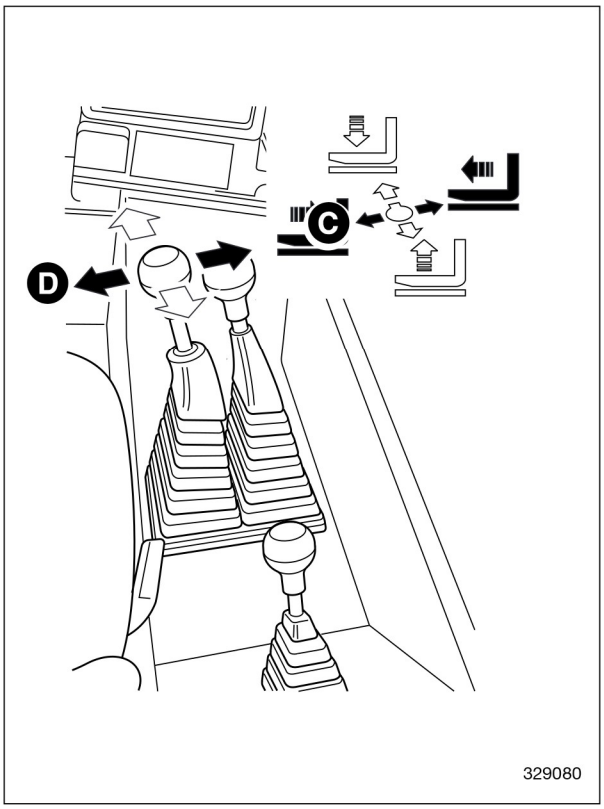
Note: Three stage booms can go out of phase if the hydraulic cylinders are not **fully** retracted regularly. Fully retract the boom at least once every day.

To re-phase the boom sections - hold the control in the retract position with the engine at high idle speed until the boom sections are fully retracted.

Loading Pattern



Placing Pattern



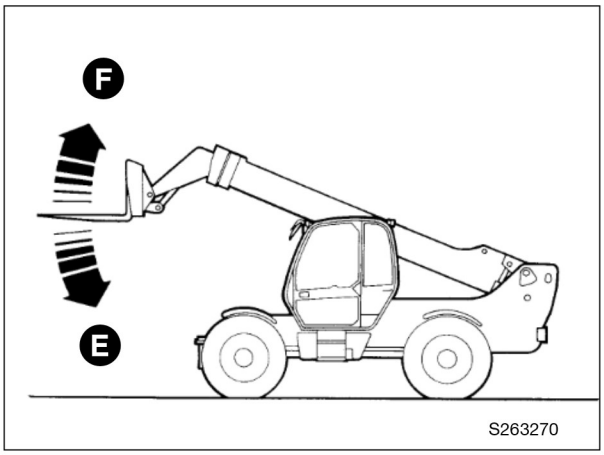
BOOM AND CARRIAGE CONTROLS
Manual Auxiliary Control

Tilt Carriage Forward/Back

⚠ WARNING

Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.
5-2-2-9

E Forward.
F Back.



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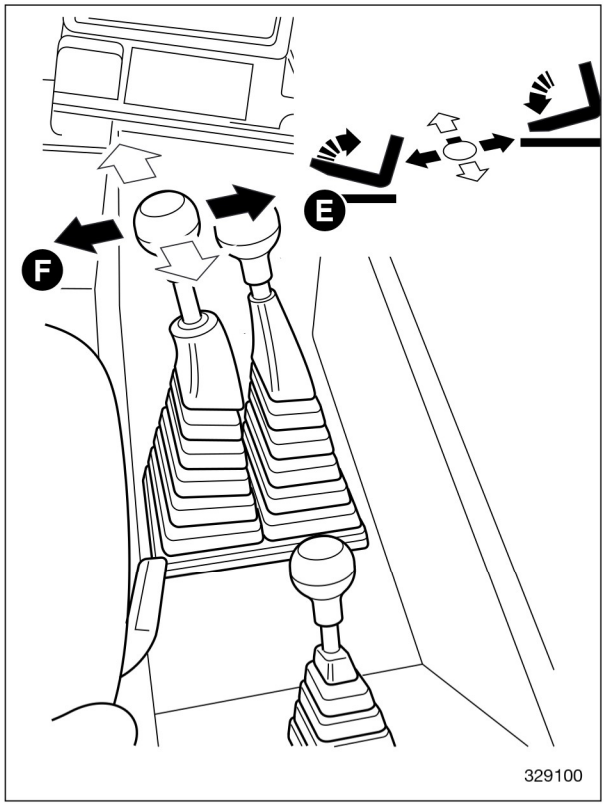
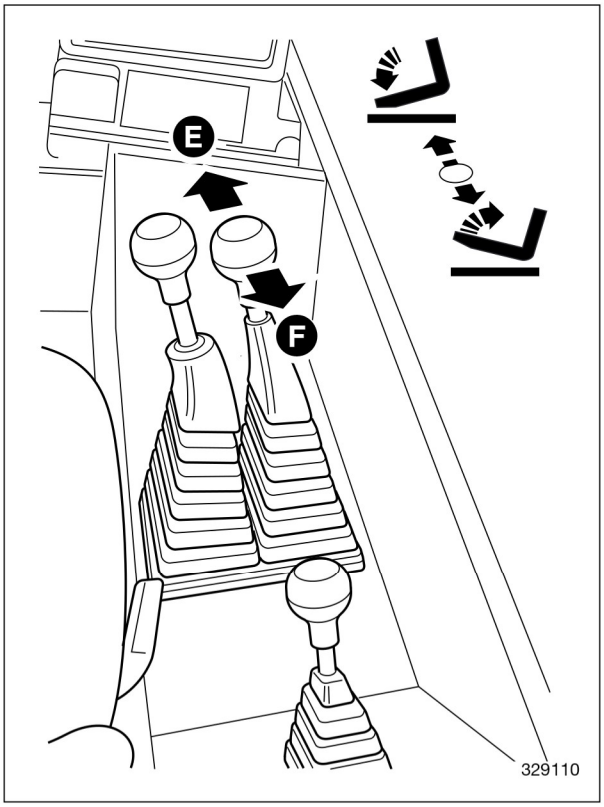


Placing Pattern



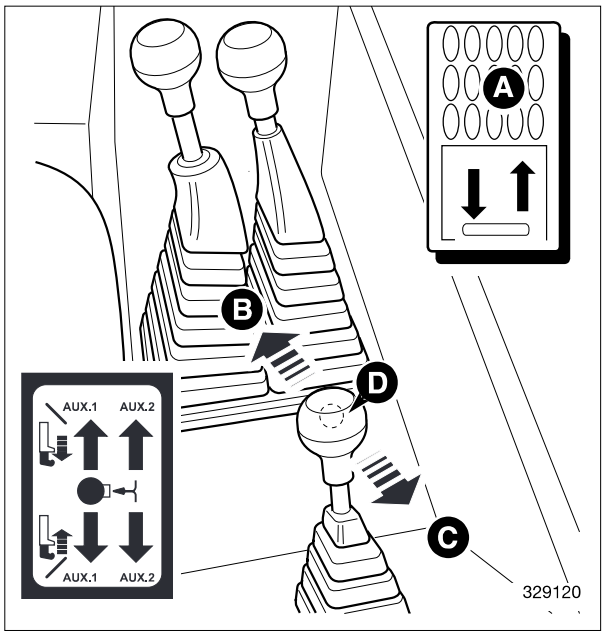
BOOM AND CARRIAGE CONTROLS
Manual Auxiliary Control

Auxiliary Operation

Note: *To fit an attachment, see* ***INSTALLING AND REMOVING Q-FIT ATTACHMENTS*** *(OPTIONAL ATTACHMENTS section).*

⚠ WARNING

Before operating the Auxiliary control system make sure that you are aware of all WARNINGS and CAUTIONS that apply to the attachment you are using. Also make sure you have fitted the attachment correctly. (see OPTIONAL ATTACHMENT section).
5-2-2-6



530 and 540 Machines

The machine is fitted with one auxiliary circuit (AUX 1). A second auxiliary circuit (AUX 2) is available as an option. An optional trailer pickup hitch, trailer brakes and trailer tip circuit is also available. In all cases there is only one auxiliary switch; selection of AUX 2 and the trailer circuits is made by means of switches.

AUX 1 - Ensure the Hitch/Auxiliary selector switch **A**, is set to **ON**, the switch light is illuminated. Move control lever in direction **B** or **C** depending on the attachment fitted and the function required.

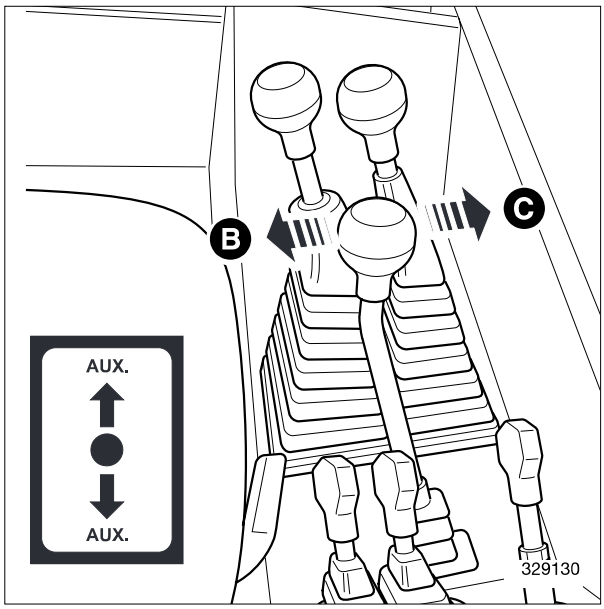
AUX 2 - Ensure the Hitch/Auxiliary selector switch **A**, is set to **ON**, the switch light is illuminated. Press and hold button button **D.** Move the control lever in direction **B** or **C** depending on the attachment fitted and the function required.

532 and 537 Machines

The machine is fitted with one auxiliary circuit (AUX 1).

AUX 1 - Move control lever in direction **B** or **C** depending on the attachment fitted and the function required.

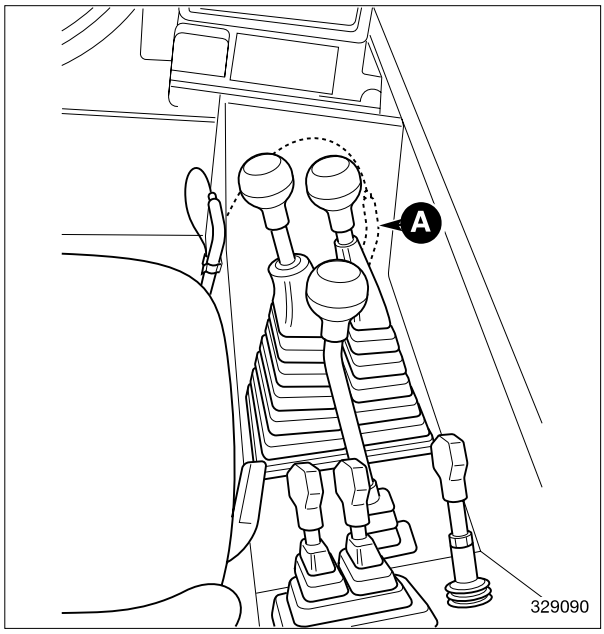
HITCH OPERATION - *See* ***Hydraulic Tow Hitch Option*** *in OPERATION Section.*



BOOM AND CARRIAGE CONTROLS
Manual Auxiliary Control

Control Locks

The requirement for control lever lock/isolation varies according to local legislation. You must comply with local legislation at all times. The locks/switches are designed to lock or isolate the control(s) in the neutral position.



All Lever Lock

Lock all the controls before travelling on public roads. To lock the controls, ensure the levers are in the neutral position, then press down pin **A** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.

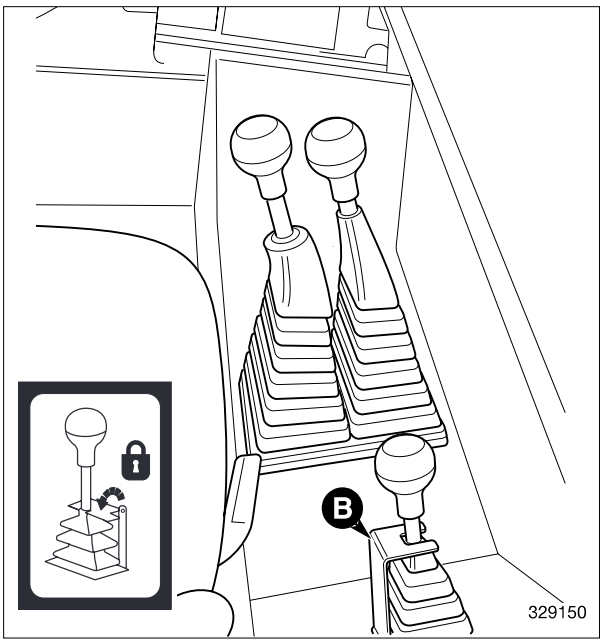
Tilt Lever Lock

This lock MUST be fitted when using a platform, *see **Working with a Platform** (this section).* To lock the controls ensure the lever tilt lever is in the neutral position, then press down pin **A** as far as it will go. Before starting the engine make sure the controls are locked. To release the lock raise the pin fully.

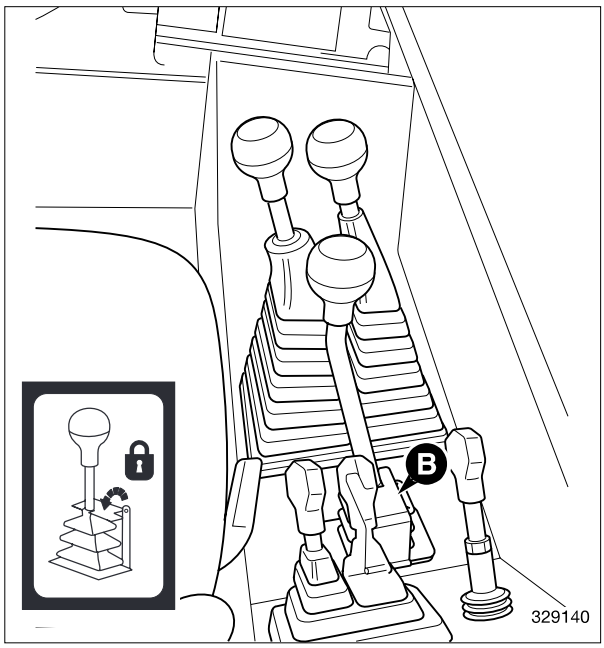
Auxiliary Lever Lock

To lock the controls, ensure the auxiliary lever is in the neutral position and move the mechanical lock **B** to the lock position. Before starting the engine make sure the lever is locked. Move the lock away from the lever to release.

530 & 540 Machines



532 & 537 Machines



BOOM AND CARRIAGE CONTROLS
Servo Control

Raise Boom/Lower Boom

⚠ WARNING

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated inside the cab
INT-2-1-3

⚠ WARNING

Operating the boom while travelling can cause accidents. You will not have total control of the machine. Never operate the boom while travelling.
5-1-5-2

⚠ DANGER

You can be electrocuted if you get your machine too close to live electrical power lines. Before starting work, find out if there are electrical power lines on the jobsite. If there are, contact the local electricity supplier and ask what safety precautions you must take. Also find out if there are any local laws and regulations concerned with work near electrical power lines.

When you have found out what safety precautions, laws and regulations apply to the jobsite, make sure they are all obeyed.
5-1-5-6

⚠ WARNING

Make sure it is clear overhead before raising the boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.
5-2-1-5/1

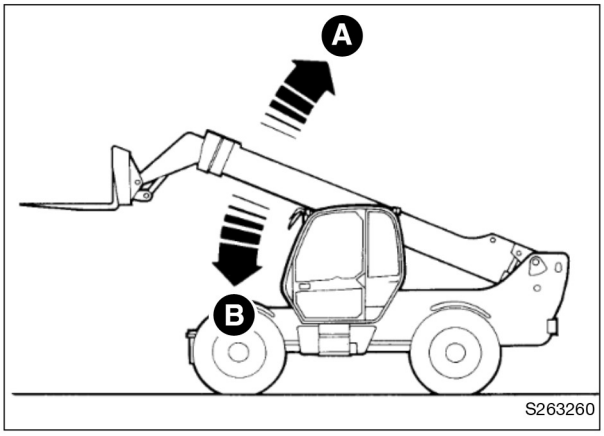
⚠ WARNING

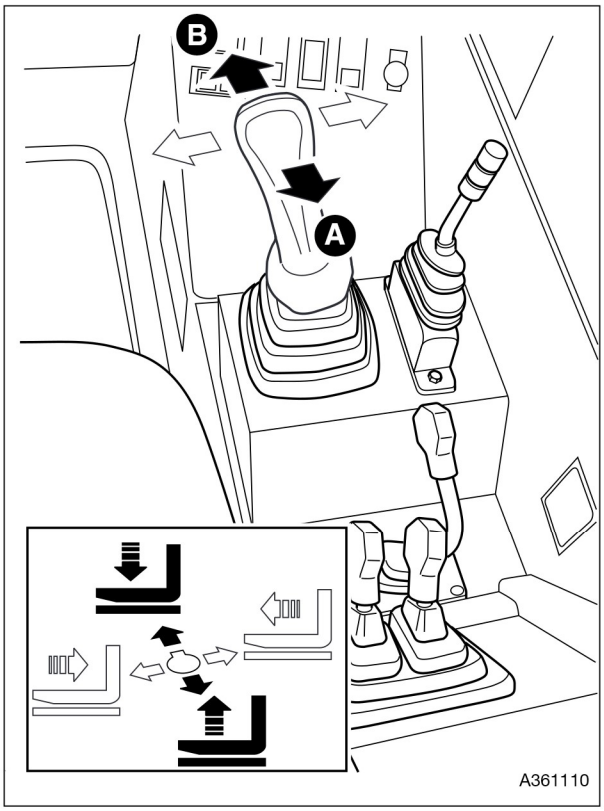
Release the boom raise lever as soon as the boom is fully raised. Holding the control in the lift position can result in the carriage slowly crowding back.
5-2-1-11

The levers are spring-loaded to their central hold positions. The speed of movement of the associated hydraulic rams depends on how far you move a lever - the further you move the lever, the faster the ram action.

The rams will stay in any position until you move them with the levers or switches.

The boom cannot be raised above 57° without lowering the stabiliser legs. *See **Using the Stabilisers** (OPERATION Section)*.





A Raise Boom
B Lower Boom

BOOM AND CARRIAGE CONTROLS
Servo Control

Extend Boom/Retract Boom

⚠ WARNING

Make sure it is clear overhead before extending a raised boom. Keep an adequate safe distance from all electrical power lines. Contact your local power company for safety procedures.

5-2-2-1/1

⚠ WARNING

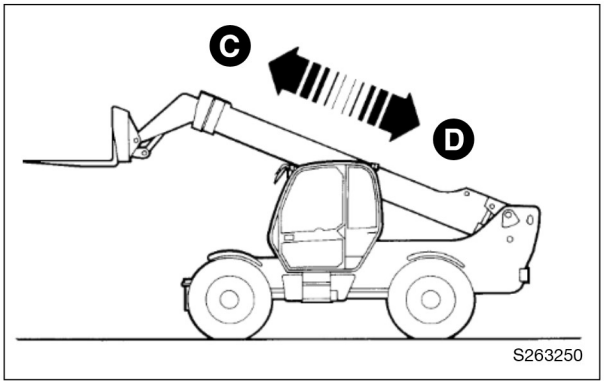
Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.

5-2-2-9

⚠ CAUTION

Do not extend the boom whilst an attachment is connected to the high flow auxiliary connectors (if fitted). Severe damage to the hoses will result.

0054



C Extend Boom
D Retract Boom

Extend Boom/Retract Inner Boom

⚠ CAUTION

Do not extend the innner boom section until all intermediate sections are fully extended. This will reduce load on the boom. Always extend the intermediate boom sections first for routine operation of the machine.

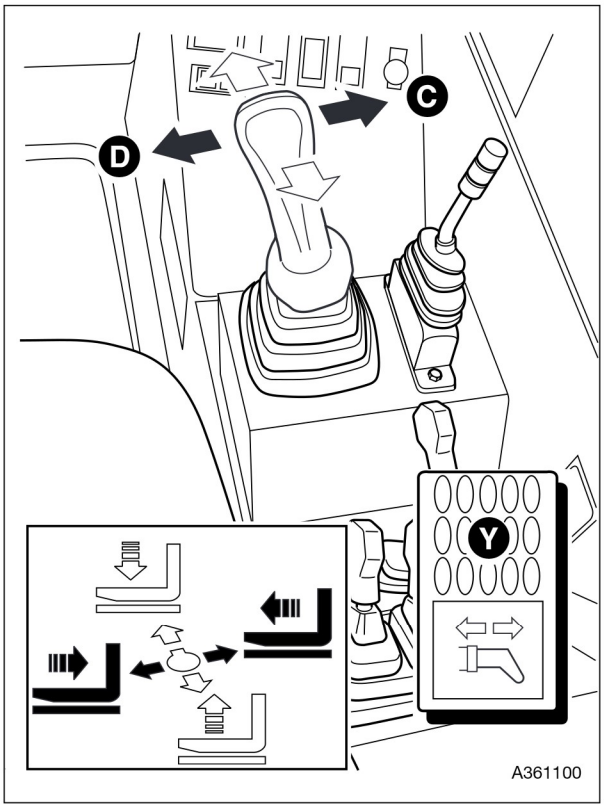
0052

The inner boom section will not operate until the stabiliser legs are lowered.

1 Lower the stabilsers. *See **Using the stabilisers** (OPERATION Section).*

2 Press switch **Y** to activate the inner boom section,

3 Operate main control lever as required.



C Extend Inner Boom
D Retract Inner Boom

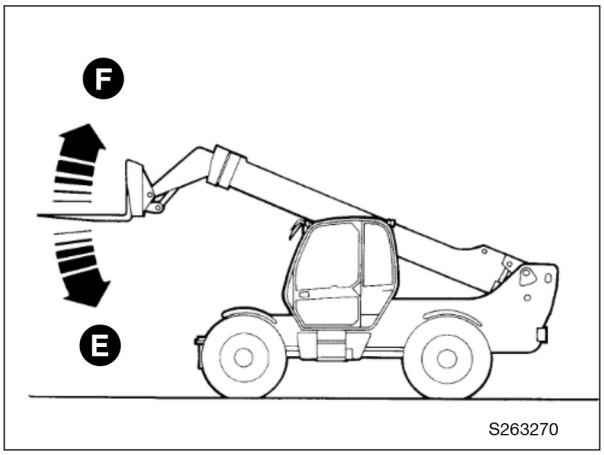
BOOM AND CARRIAGE CONTROLS
Servo Control

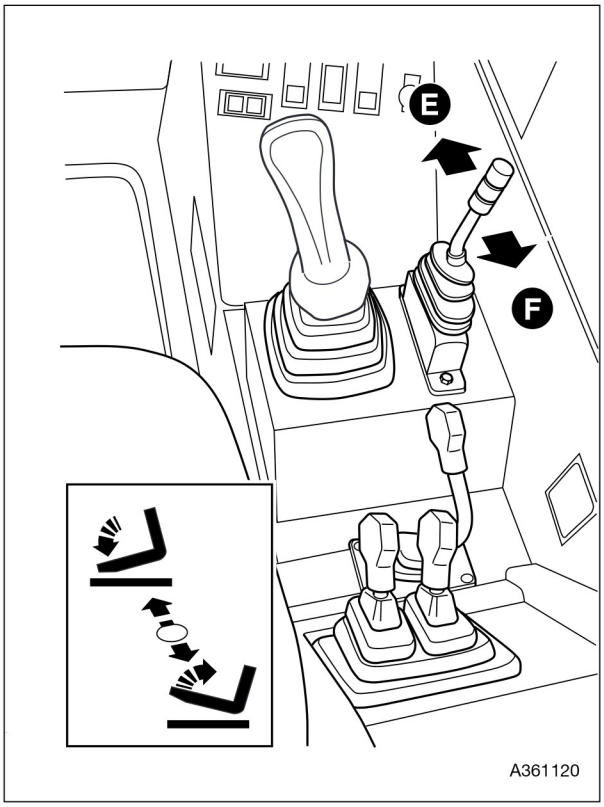
Tilt Carriage Forward/Back

⚠ WARNING

Control lever/switch action may vary on machines, decals near the levers/switches show by symbols, which levers/switches cause what actions. Before operating control levers/switches check the decal to make sure you select the desired action.
5-2-2-9

E Forward.
F Back.





BOOM AND CARRIAGE CONTROLS
Servo Control

Auxiliary Operation

Note: *To fit an attachment, see* ***INSTALLING AND REMOVING Q-FIT ATTACHMENTS*** *(OPTIONAL ATTACHMENTS section).*

⚠ WARNING

Before operating the Auxiliary control system make sure that you are aware of all WARNINGS and CAUTIONS that apply to the attachment you are using. Also make sure you have fitted the attachment correctly. (see OPTIONAL ATTACHMENT section).
5-2-2-6

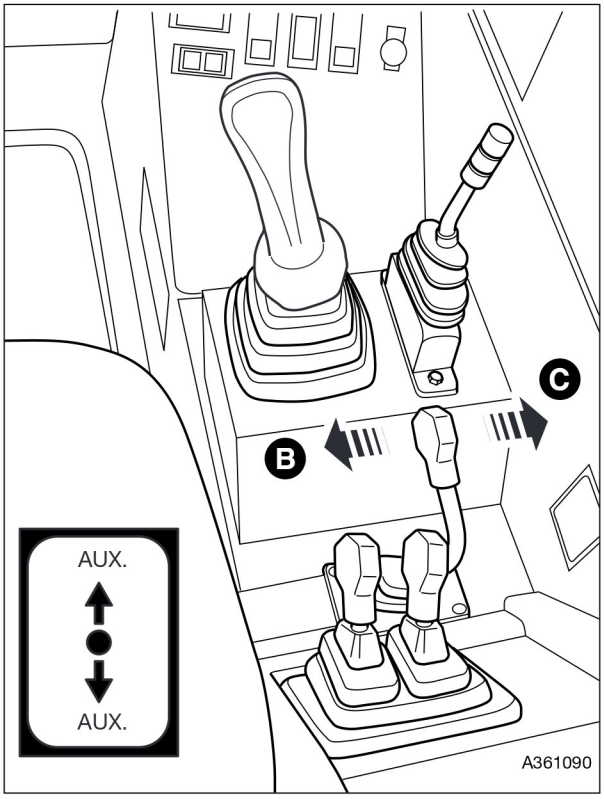
The machine is fitted with one auxiliary circuit (AUX 1). This circuit has standard couplings **D** at the end of the boom and (if fitted) a set of high flow couplings **E** on the outer boom. High flow will only operate if the standard couplings are not connected.

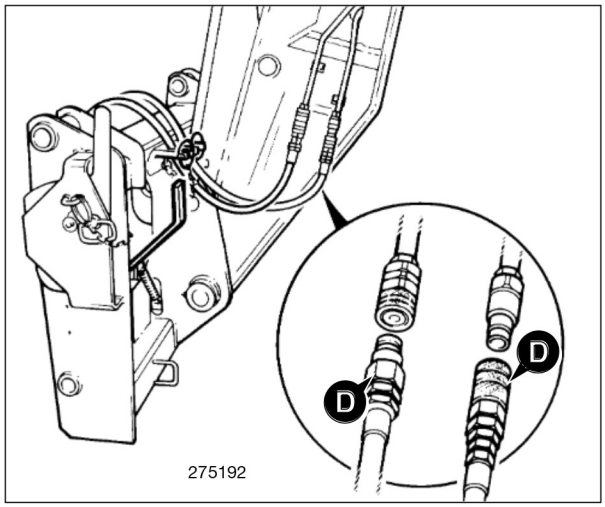
⚠ CAUTION

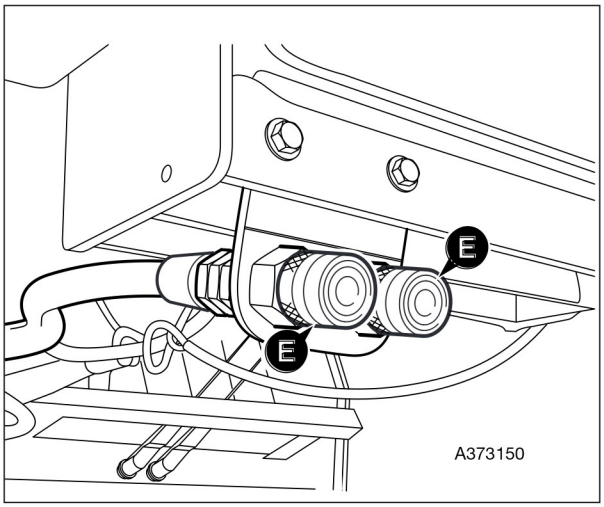
Do not extend the boom whilst an attachment is connected to the high flow auxiliary connectors (if fitted). Severe damage to the hoses will result.
0054

Standard and high flow attachments use the same controls.

AUX 1 - Move control lever in direction **B** or **C** depending on the attachment fitted and the function required.







BOOM AND CARRIAGE CONTROLS
Servo Control

Control Locks

The requirement for control lever lock/isolation varies according to local legislation. You must comply with local legislation at all times. The locks/switches are designed to lock or isolate the control(s) in the neutral position.

All Lever Lock

Lock all the controls before travelling on public roads. To lock the controls:

1 Ensure the levers are in the neutral position

2 Turn switch **A** to position **B.**

Before starting the engine make sure the controls are locked.

Turn the switch to the central position **C** to release the lock.

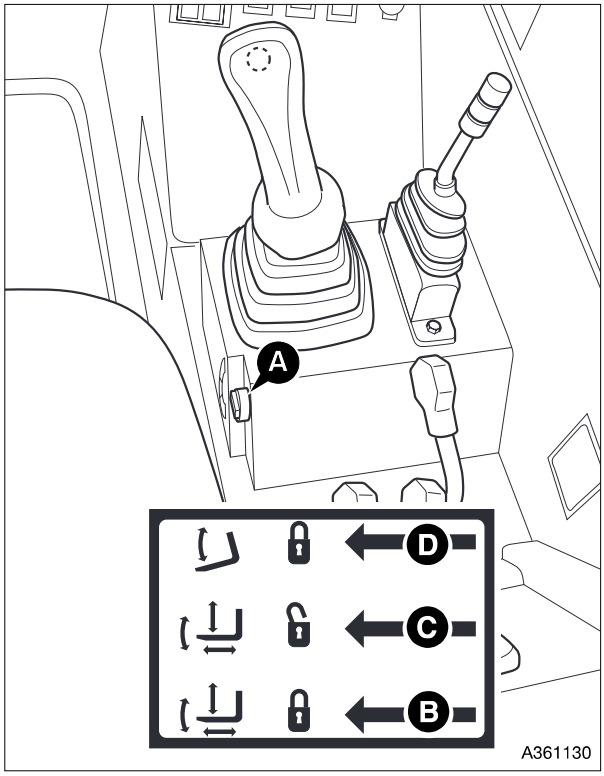
Tilt Lever Lock

This lock MUST be fitted when using a platform, *see **Working with a Platform** (this section).* To lock the controls:

1 Ensure the levers are in the neutral position

2 Turn switch **A** to position **D.**

Turn the switch to the central position **C** to release the lock.



CHASSIS LEVELLING (SWAY) OPTION

The chassis levelling (sway) control switch allows the machine to be levelled from side to side before loading and unloading. The switch must also be used to level the machine from side to side before travelling.

The ram will stay in any position until you move it with the switch.

The switch movements and chassis levelling movements are indicated on a decal.

Chassis levelling (sway) cannot be operated once the boom is higher than 10° above the horizontal.

⚠ WARNING

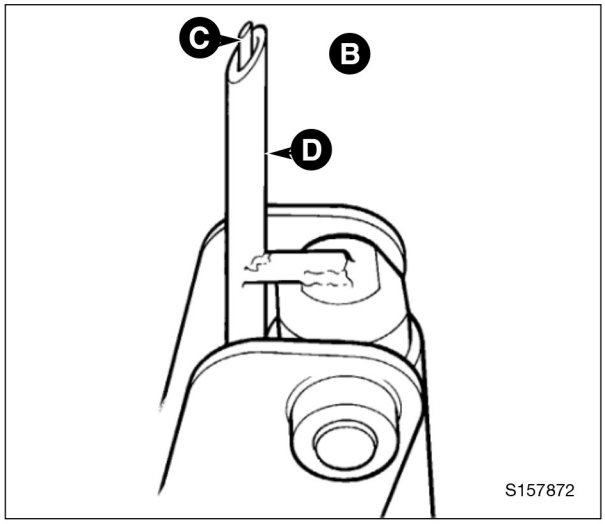
Never operate the chassis levelling (sway) control when the boom is above the horizontal position. Never operate the boom if the machine is not level.

Use chassis levelling (sway) to level the machine before operating the boom. Reposition the machine if a level position cannot be achieved.

Never operate chassis levelling (sway) when the machine is moving.
The machine could tip over if you do not obey these safety rules.
5-2-2-5/3

⚠ WARNING

You or others can be killed or seriously injured if you operate the control levers from outside the cab. Operate the control levers only when you are correctly seated in the cab.
INT-2-1-3

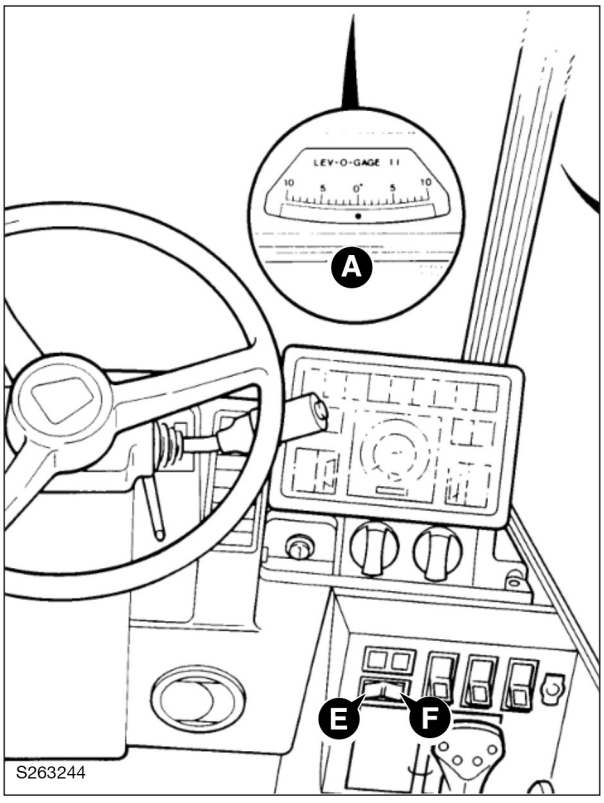


Use inclinometer **A** to check that the machine is level before operating the boom. The machine is level when the inclinometer shows zero degrees (0°).

Use indicator **B** to check that the body of the machine is square to the axles before driving the machine. The machine is square to the axles when rod **C** is level with the top end of tube **D**. When the rod is above the tube, the machine is swayed to the right. When the rod is down inside the tube, the machine is swayed to the left.

Sway Left/Sway Right

E Left.
F Right.



STABILISER CONTROL OPTION

Using the Stabilisers

⚠ WARNING

Do not allow debris to accumulate in the cavity between the ram and the stabiliser leg. Remove and clean away all debris that may have built-up.

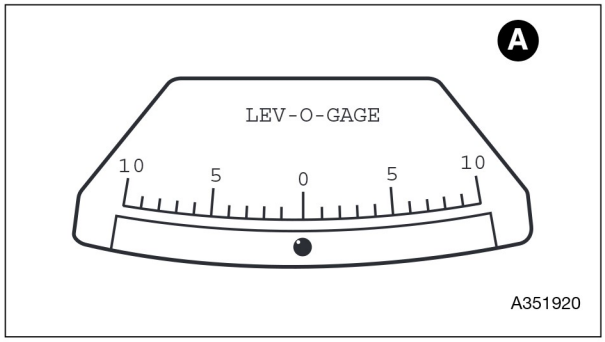
0001

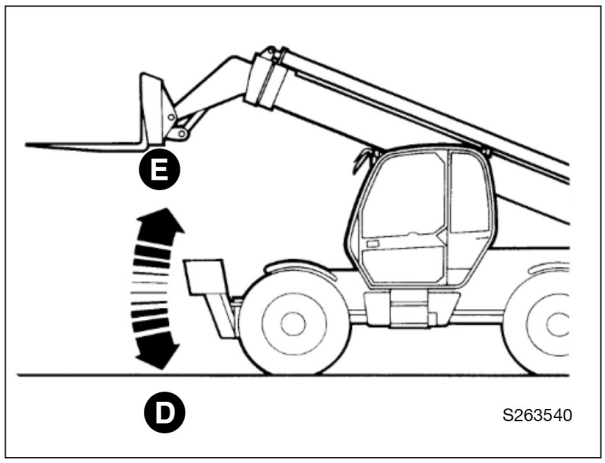
The use of stabilisers increases the stability of the machine when lifting.

The lateral position of the machine is indicated by an inclinometer **A** fitted in the cab. Use inclinometer to check that the machine is level before operating the boom. The machine is level when the inclinometer shows zero degrees (0°).

Reposition the machine if a level position cannot be achieved.

Ensure the stabiliser legs are in the down position and the weight of the machine is supported. Do not extend the boom more than necessary. Isolate the stabiliser control levers before operating the machine.





Some machines are fitted with optional stabiliser indicator lights **B**. The lights will illuminate when both stabiliser legs are in the down position and the weight of the machine is supported.

If fitted, ensure both indicator lights illuminate when the stabiliser legs are in the down position. If the lights do not illuminate **do not use the machine** until the fault is investigated and corrected.

As a safety feature, the stabilisers cannot be operated once the boom is higher than 45° above the horizontal.

Lower and Raise Stabilisers

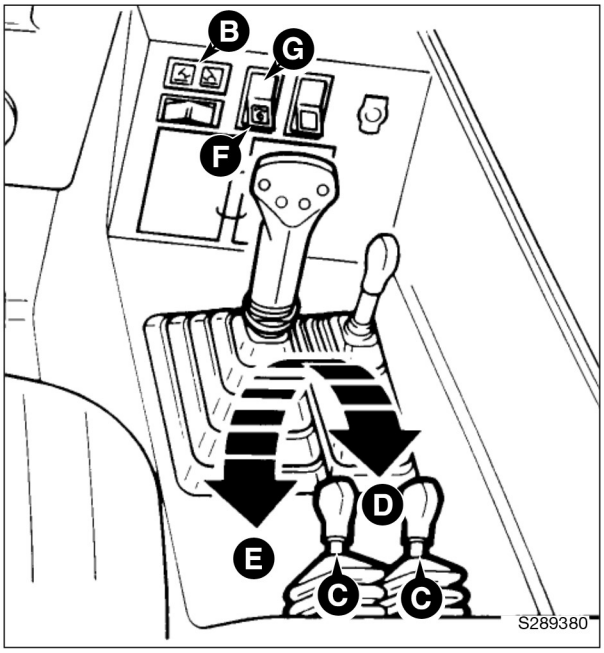
On 540-170 machines, the stabilisers cannot be raised until all the boom sections are fully retracted.

To isolate the control levers **C** press lock on switch **F**. To make the control levers operable press opposite switch **G**.

Before travelling on the public highway, fully raise both stabiliser legs and isolate control levers **C**.

When working with the stabilisers lowered isolate the control levers **C** before operating the boom controls.

D Lower
E Raise



BEFORE STARTING THE ENGINE

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

1 The parking brake should have been engaged when the machine was last parked. But if it is not already engaged, engage it now. The engine will not start unless the parking brake is engaged.

⚠ DANGER

Before lowering the carriage 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 carriage, or get caught in the linkages.
5-2-2-2

2 The carriage should have been lowered to the ground when it was last parked. If not, start the engine, *see* ***Starting the Engine*** *this section*, and lower the carriage to the ground. Then stop the engine before continuing with Step 3.

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

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

b Remove dirt and rubbish from the cab interior, especially around the pedals and control levers.

⚠ WARNING

Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you will lose control of the machine.
2-2-3-6

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

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

⚠ WARNING

Loose articles can fall and strike you or roll on the floor. You could be knocked unconscious, or the controls could get jammed. If that happens you will lose control of the machine.
2-2-3-7/1

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

f Inspect the ROPS/FOPS structure for damage. Get your JCB distributor to repair any damage.

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

⚠ WARNING

Do not use a seat belt which is damaged or excessively worn.

Do not use a seat belt that has been in an accident.

A worn, damaged or already stressed seat belt could break or give way in a collision. If that happens you could be killed or injured.
2-2-3-8

⚠ WARNING

Do not drive the machine without wearing the seat belt, properly fastened and adjusted.
2-2-3-9

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

4 Check that the following are in working order:

Lights, Warning Lights, All switches, Direction Indicators, Hazard Warning Lights, Windscreen Washer and Wipers, Reverse Alarm.

5 Adjust the seat so that you can comfortably reach all the driving controls. You should be able to apply full brake pedal travel with your back against the seat back.

6 Set the rear view mirror(s) to give you a good view close behind the machine when you are correctly seated.

STARTING THE ENGINE

1 Read ***Before Starting the Engine*** on the previous page.

2 The parking brake should have been engaged when the machine was last parked. If it is not engaged, engage it now.

3 Put the Forward/Reverse lever in neutral. The engine will not start unless the forward/reverse lever is in neutral.

4 The battery isolator key must be fitted and switched on before attempting to start the engine, *see* ***Battery*** *(MAINTENANCE section).*

⚠ WARNING

The ROPS cab is designed to give you protection in an accident. If you do not wear your seat belt you could be thrown about inside the cab, or thrown out of the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.
2-2-1-9

5 If the machine is fitted with Immobiliser Option, insert and remove immobiliser key to deactivate the system. *See* ***Immobiliser Option*** *(INTRODUCTION section).*

6 Fully depress the accelerator pedal and hold it down. Turn the starter switch to position **D** and hold it there until the engine starts. Once the engine has started, release the starter key. The switch will return to position **B**. Ease off on the accelerator pedal to reduce engine speed.

If the outside temperature is low, say 0°C (32°F) or below, turn the starter switch key to the 'heat' position **C** for 15-30 seconds to warm the engine induction manifold.

If the engine has not started after 20 seconds, release the starter key. Wait two minutes before attempting another start. This will allow the starter motor to cool down.

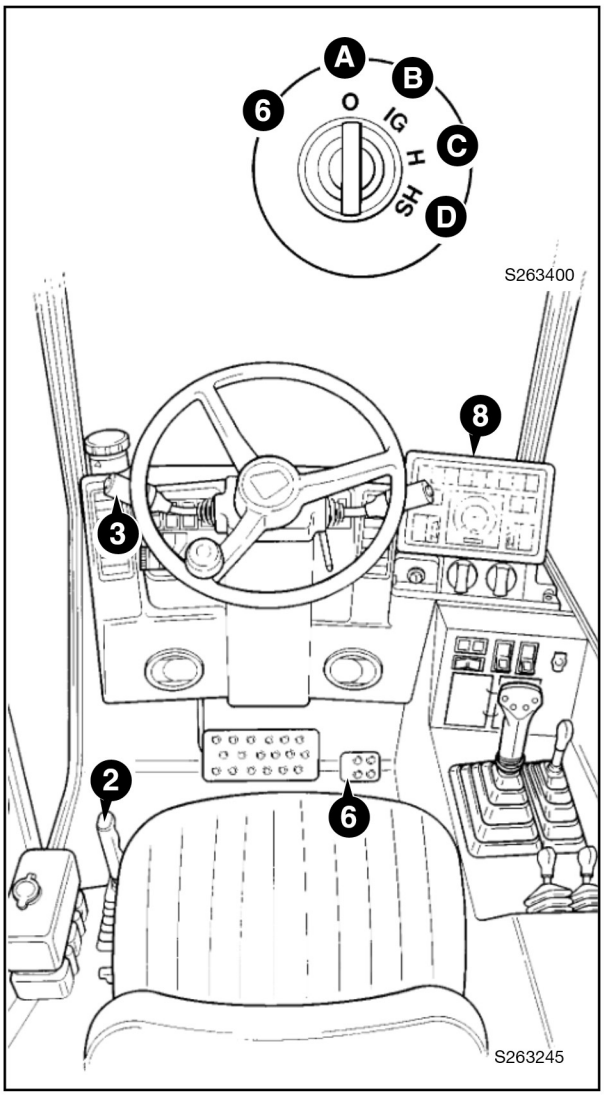
Note*: New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the piston cylinder bores resulting in excessive oil consumption could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load).*

7 Allow the engine to warm up above idle speed and operate the boom a few times to help warm up the hydraulic system.

8 Once the engine has started, check that all the warning lights have gone off. Do not race the engine until the **engine oil pressure low light** has gone out. Racing the engine too soon could damage the turbo-charger due to under-lubrication. Check that the audible alarm is silent.

Note*: 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.*

If the battery is not fully charged and the engine fails to start, *see* ***Jump-Starting the Engine*** *(MAINTENANCE section).*



PREPARING FOR ROAD TRAVEL

IMPORTANT NOTE: Whilst this information is believed to be correct, JCB cannot be aware of all circumstances in which the JCB machine may be operated on a Public Highway and it is the responsibility of the user to ensure compliance with the regulations.

Make sure you will be obeying all pertinent laws and regulations before you take the machine on public roads.

1 In certain countries ie. Italy, legislation requires the front windscreen guard (if fitted) is removed before travelling on public roads.

2 Use the chassis levelling (sway) switch, (if fitted) to set the body of the machine square to the axles. *See **Chassis Levelling (Sway) Option** (this section)*.

3 Ensure both stabiliser legs, (if fitted) are fully raised and isolated. *See **Stabiliser Control Option** (this section).*

4 Fully retract the boom. Lower the boom fully then raise it slightly. Tilt the carriage back, to keep the heel of the forks **A** 100-150 mm (4-6 in) above the ground.

⚠ WARNING

Forks are heavy. Take care when spacing forks or folding back the forks.
0002

5 In certain countries legislation requires the forks to be folded back before travelling on public roads. Fit fork retention brackets **B** (as required) and secure with retaining pin **C** and locking pin **D**.

6 In certain countries ie. Germany, legislation requires the forks to be removed and safety guard **E** fitted. Check local requirements.

7 In certain countries ie. Italy, legislation requires safety marker plate **F** to be fitted before travelling on public roads.

In the UK, before travelling on public roads, it is your responsibility as a user to comply with The Road Vehicles (Construction and Use) (Amendment) Regulations 1997 ('Bridge Bashing Regulations'). By way of guidance only, the following steps may be taken to comply:

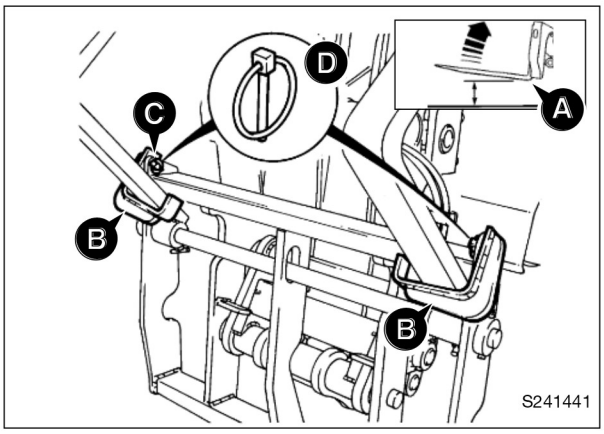
i Always assess your route for overhead structures, such as bridges, which could be damaged by your machine.

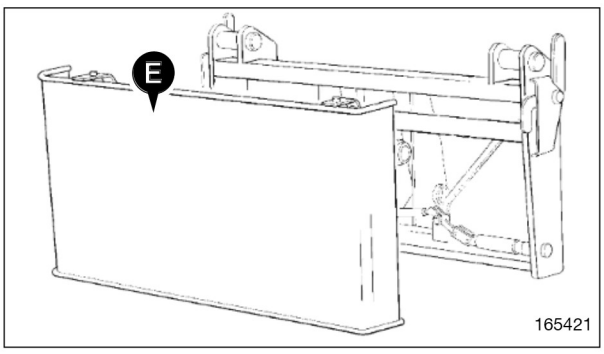
ii Utilize the restraining device (Described) to ensure the equipment is in the travelling position.

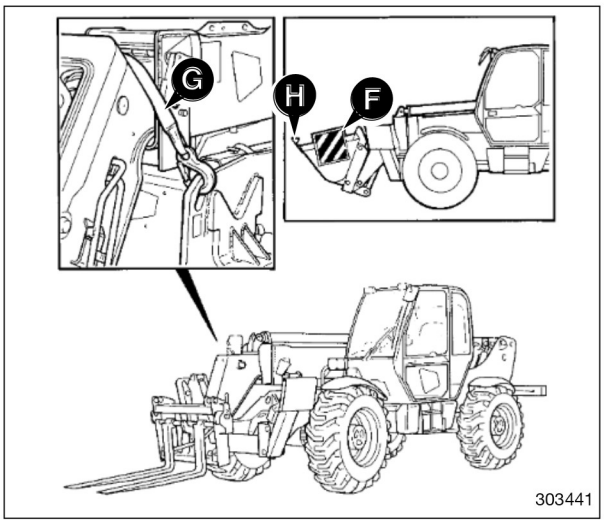
8 With the boom in the travel position, fit restraining strap **G** over the boom and attach to the lifting lugs on the chassis side plates.

⚠ CAUTION

In low visibility or at night, we recommend removing the forks before travelling on public roads. Transport the forks on a suitable vehicle.
5-2-3-2







PREPARING FOR ROAD TRAVEL (continued)

9 If any optional attachments are fitted, make them safe as detailed in ***OPTIONAL ATTACHMENTS*** *section.*

10 When travelling with a bucket, tooth guard **H** must be fitted.

⚠ CAUTION

Do not travel on public roads with the machine loaded.
5-2-3-1

11 Lock the controls (as required), *see* ***Control Locks*** *(this section).*

12 Phase the road wheels, *see* ***Phasing 4 Wheel Steer*** *(this section).*

⚠ WARNING

When travelling on public highways select 2-wheel steer and lower the hinged lockplate over the selector switch. Do not use crab steer or 4-wheel steer on public highways.
5-1-5-8

13 Select 2 wheel steer, do not use crab steer or 4-wheel steer on public roads. Lock the steer mode selector by lowering the hinged flap **J**.

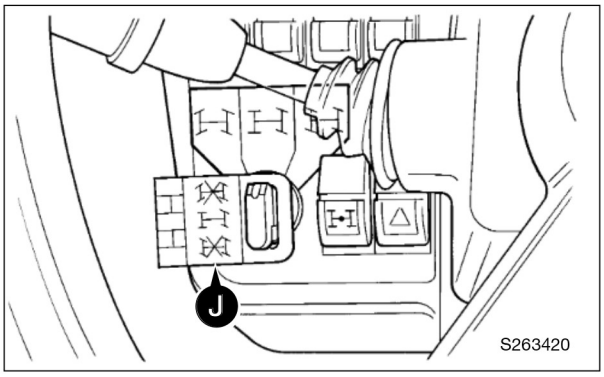
14 Raise both front headlights to the road travel position. Undo handle **K** and raise the front headlights to highest position**.** Refit handle **K** and tighten to secure in position. Check that all road lights are working correctly.

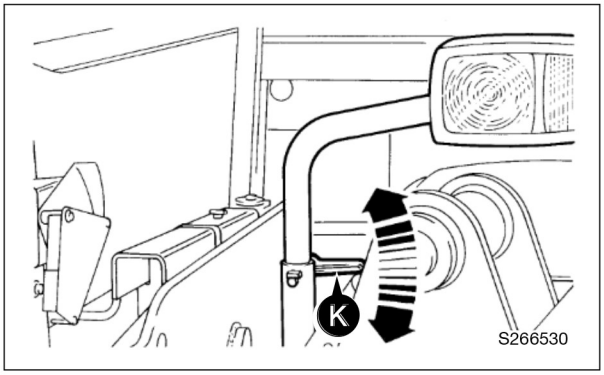
15 Move the rear light cluster to the horizontal position. The cluster is spring loaded by its rubber mounting bush. To swing it up **L** or down **M**, whichever is applicable to your machine, pull the cluster slightly rearward to disengage, then swing it to the new position.

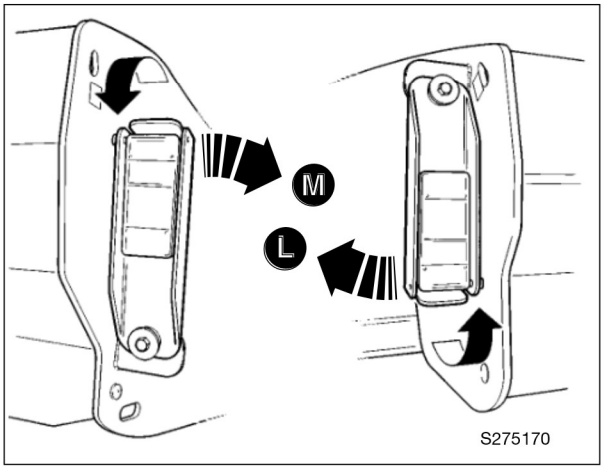
16 The traffic regulations may require you to have a warning beacon operating on some public roads. *See* ***Warning Beacon*** *(this section).*

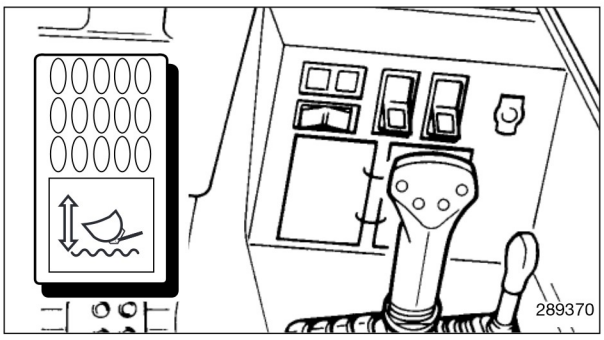
17 If towing, *see* ***Mechanical Tow Hitch***, ***Hydraulic Tow Hitch Options*** *(this section).*

18 Switch on Smooth Ride System (if fitted). *See* ***Smooth Ride System*** *(this section).*









PREPARING FOR SITE TRAVEL

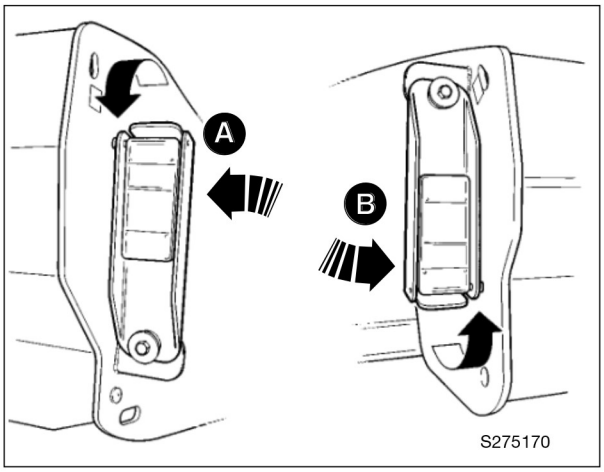
1 Use the chassis levelling (sway) switch, (if fitted) to set the machine body level with the axles.

2 Ensure both stabiliser legs, (if fitted) are fully raised and isolated.

3 Fully retract the boom. Lower the boom fully then raise it slightly. Tilt the carriage back, to keep the heel of the forks 100 - 150 mm (4 - 6 in) above the ground.

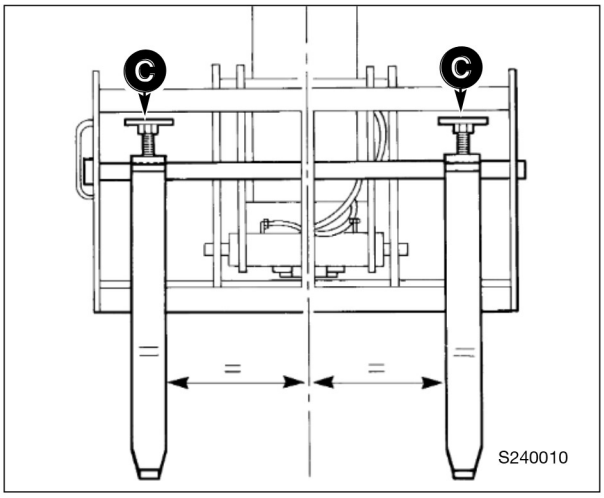
***Note**: When attachments are fitted, position the boom in the 'low carry' position so that the right hand mirror is not hidden from the operators view.*

4 To prevent damage raise **A** or lower **B** the rear light cluster, whichever is applicable to your machine. The cluster is spring loaded by its rubber mounting bush. To swing it up or down, pull the cluster slightly rearward to disengage, then swing it to the new position.

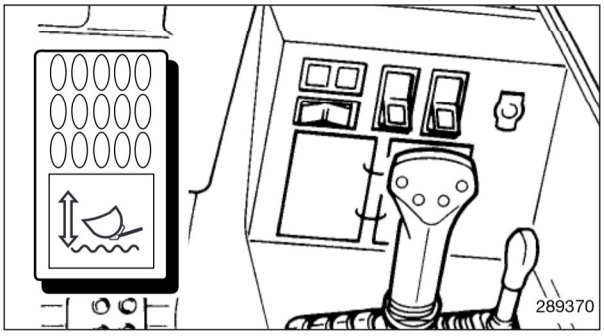


5 Fully tighten the clamping screws **C** to prevent side movement of the forks.

6 If any optional attachments are fitted, make them safe as detailed in ***OPTIONAL ATTACHMENTS** section.*



7 Switch on Smooth Ride System (if fitted). *See **Smooth Ride System** (this section).*



SMOOTH RIDE SYSTEM

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

It is intended for use whilst travelling, but will also enhance machine operation when used in loading and rehandling 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.

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

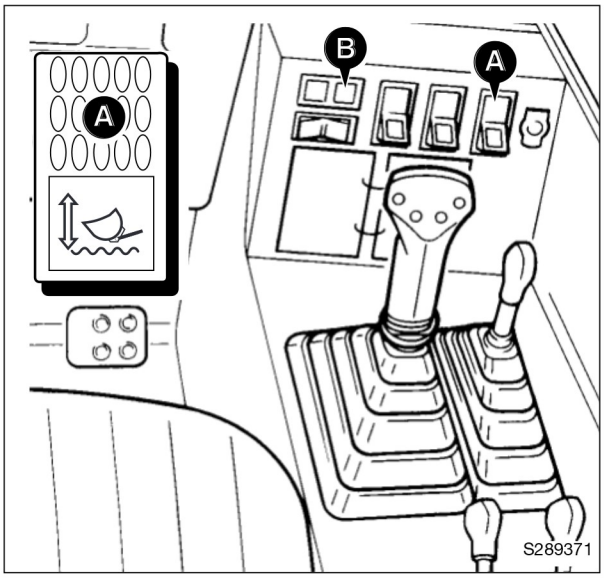
1 Lower the boom to the ground.

2 Press switch **A** fully down to activate the system. The switch will spring back to the ON position. Indicator light **B** will illuminate when SRS is engaged.

If light **B** does not illuminate, make sure the boom is fully lowered and repeat step 2.

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

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



⚠ DANGER

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 is released or returned to the neutral position.

Switch off SRS before working on the machine.

0032

TESTING THE PARKING BRAKE

SAFETY NOTICE: Ensure all routine health and safety precautions are observed before operating machines.

⚠ WARNING

Before testing the parking brake make sure the area around the machine is clear of people.
2-2-4-5

1 Enter the machine. Fasten your seat belt (if fitted) and park the machine on a level dry surface.

2 Fully apply parking brake **1**.

3 Start the engine and raise the attachments to the appropriate travelling position.

4 Select fourth gear **2**.

5 Push down hard on foot brake pedal **3**.

6 Select forward drive **2**.

⚠ WARNING

If the machine starts to move during the following test, immediately apply the foot brakes and reduce the engine speed.
2-2-5-1

Test the parking brake as follows:

7 Move the parking brake lever fractionally forward until the warning light **4** is just extinguished.

8 Slowly release the foot brake pedal **3**.

9 If the machine has not moved, use the accelerator to gradually increase the engine speed to approximately 1500 RPM. The machine should not move.

10 Do not do this test for longer than 20 seconds.

11 Reduce engine speed to idle and select neutral **2**.

12 Return park brake lever **1** to the fully on position from its partially applied position.

13 Lower attachments and stop the engine.

14 If the machine moved during the test, adjust the parking brake and repeat the test. See **Parking Brake Adjustment** (MAINTENANCE section).

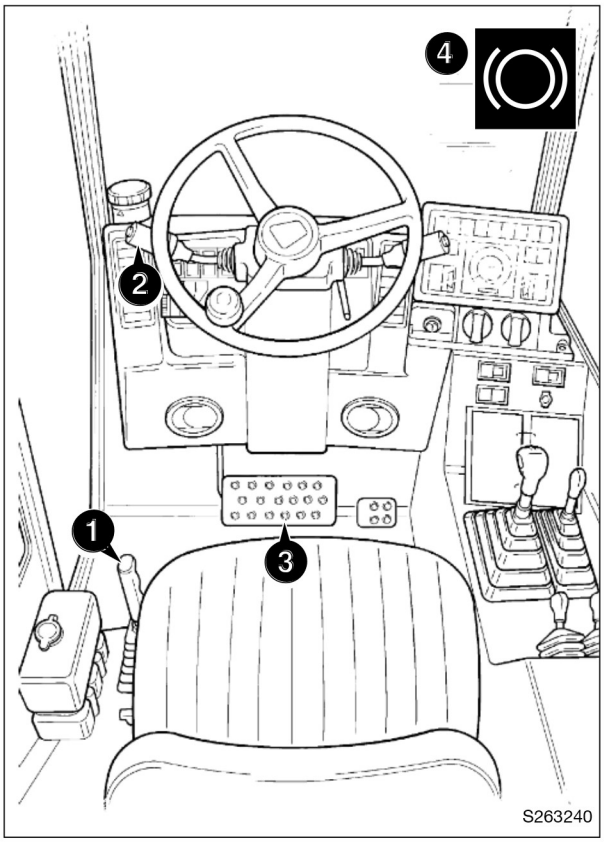
If you have any queries concerning this test procedure or parking brake adjustment, consult your local JCB distributor.

⚠ WARNING

Do not use a machine with a faulty parking brake.
3-2-3-10

⚠ CAUTION

Non approved modifications to axle ratios, machine weight or wheel and tyre sizes may adversely affect the performance of the parking brake.
3-2-3-11



GETTING THE MACHINE MOVING

After you have warmed up the engine and tested the parking brake, move off as described. *Read the **Operating Practices** and **WARNINGS** first.*

Operating Practices

⚠ 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. Operate in first gear on hillsides, when applicable keep all attachments low to the ground. Never coast down a hill with the engine off or the transmission in neutral.
INT-2-2-7

The machine can be put in motion in any gear. But do not overwork the engine unnecessarily, by using too high a gear on a hill for example. 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.

⚠ CAUTION

Do not dismount a moving machine.
3-2-3-12

Do not use the brake pedal as a footrest.

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.

⚠ WARNING

Always drive a LOADED machine FORWARD UPHILL and in REVERSE DOWNHILL.
9-1-3-7

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.

Always select first gear before travelling downhill with a heavy load. Use the brake pedal to prevent overspeeding.

Approach deep mud in first gear with the wheels straight.

Take particular care when reversing. Make sure your view of **both** rear mirrors is not obstructed. Ensure that the way behind is clear before reversing. Ensure that the reverse alarm is functioning correctly and can be heard clearly by people around the machine.

***Note**: Various types of reverse alarm can be installed on your machine, to suit different operating environments. There may be local regulations which control the type of reverse alarm which may be used in particular areas. Make sure the correct type of reverse alarm is installed on your machine.*

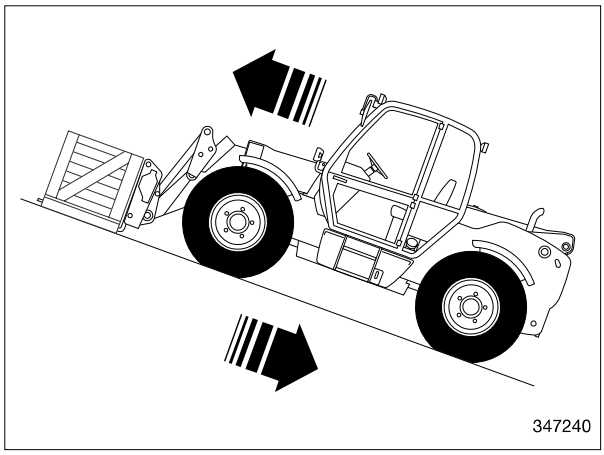
⚠ WARNING

Should the machine start to roll over, you can be crushed if you try to leave the cab. If the machine starts to roll over, DO NOT TRY TO JUMP FROM THE CAB. STAY IN THE CAB, WITH YOUR SEAT BELT FASTENED.
INT-2-1-12

Limited Slip Differential (LSD)

This is an option which can be specified on some machines to enhance traction in difficult conditions. This is achieved by transferring a high proportion of the available driving torque from the spinning wheel to the gripping wheel. The limited slip differential operates automatically and should not be confused with differential locks.

Wheel slip is an indication that the limited slip limit has been reached. On high traction surfaces (concrete etc.) noise and judder may be experienced when the LSD is operating, particularly on full steering lock. The level of noise depends on the weight of the machine, the ground conditions and steering angles. Noise in the LSD is not an indication of axle damage.



GETTING THE MACHINE MOVING (continued)

Some machines are fitted with a five speed transmission. *See also* ***Operation of Five Speed Transmission*** *(this section).*

1 Check that the boom is in the travel position.

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.

3 Select a gear, rotate the barrel **A** so that the arrow marked on the barrel aligns with the required gear.

Some machines are protected by an electronic control unit (ECU). This prevents downward gear changes and forward/reverse direction changes until a predetermined speed is achieved. The following warning and caution apply to machines with ECU controlled transmission.

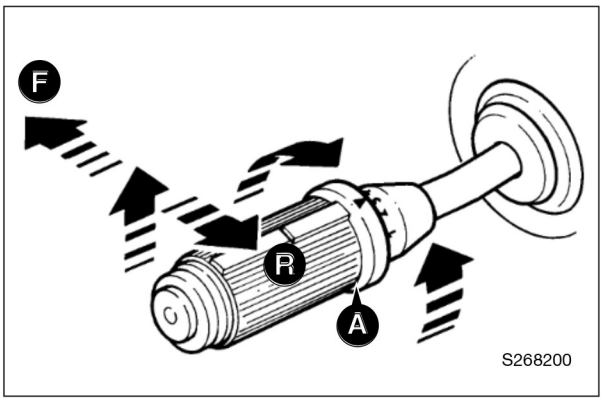
⚠ CAUTION

Gear or direction changes on this machine will only occur at a predetermined speed, this may result in gear/direction change delays. To prevent unexpected gear changes only select gears or direction as they are required.
2-1-1-14

⚠ WARNING

If 4th gear fails to engage it could indicate a failure of the transmission electronic protection system. You can continue to use the machine but do not select forward/reverse or change from from a high gear to a low gear (for instance, 3rd to 1st) in one sudden movement whilst the machine is moving.
2-1-1-13

If the transmission electronic protection system fails contact your nearest JCB Distributor to get the fault rectified as soon as possible.



To change gear when the machine is moving rotate the barrel **A** so that the arrow marked on the barrel aligns with the required gear, you do not need to depress the dump pedal.

A lower gear will not engage if the machine is travelling too fast.

The machine can be moved off in any gear, depending on ground conditions.

When the machine is stationary, make sure the forward/reverse lever is in neutral position and the engine at idle speed before selecting a gear.

Now that you have engaged a gear, the road wheels will be connected to the engine as soon as you move the forward/reverse lever away from neutral.

Depending on the ground condition and the gear you have selected, the machine may then try to move off before you are ready. The following procedure makes sure you keep full control of the machine.

4 Push the brake pedal hard down.

5 Release the parking brake.

Note*: If forward or reverse drive is selected before the parking brake is released, an audible alarm will sound to remind you that the parking brake is still engaged.*

6 Select forward/reverse, lift the lever and move the lever to the position required **F** forward, **R** reverse.

7 **MAKE SURE IT IS SAFE TO MOVE OFF**, then release the brake pedal and push down on the accelerator pedal. The machine will move smoothly away.

⚠ WARNING

Reversing at high speeds can cause accidents. Do not reverse in a high gear with full throttle. Always drive at a safe speed to suit working conditions.
INT-2-2-9/1

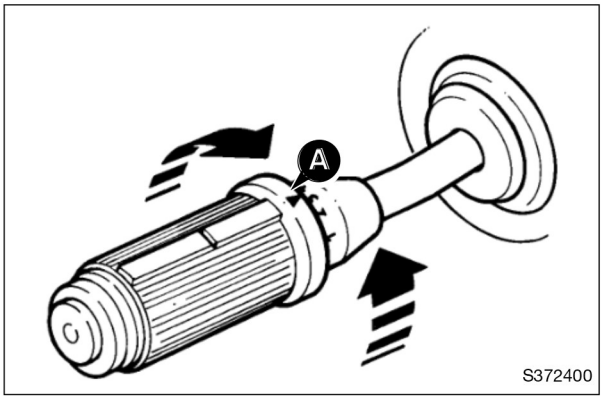
8 While the machine is travelling slowly, check the steering and brakes. Do not drive the machine unless the steering and brakes are working correctly. If you are not sure, assume they are faulty.

⚠ WARNING

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.
5-2-3-3

GETTING THE MACHINE MOVING (continued)

Operation of Five Speed Transmission



530FS Super and 540FS Super machines are fitted with a five speed transmission which is controlled by an electronic control unit (ECU). Gears 1 to 4 are selected by rotating barrel **A**.

Fourth position is labelled 'A' on Super machines. This mode is recommended for road travel only. Use positions 1, 2 and 3 for on-site work.

The transmission will change from fourth gear to fifth gear automatically once a pre-set speed is reached in fourth gear.

Maximum road speed in 5th gear is increased to 40 km/hr (25 mph) where legislation allows. Fifth gear is not available in reverse.

Downshift Protection

The ECU will protect the transmission when changing down. If the speed is too high, two audible bleeps will sound when a lower gear is selected. The transmission will remain in the currently selected gear until the speed has reduced sufficiently for the downshift to occur.

This feature must not be used to pre-select a lower gear.

STOPPING AND PARKING THE MACHINE

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

1 Ease up on the accelerator pedal and down on the brake pedal to bring the machine to a smooth stop. Keep the foot brakes on until the parking brake has been engaged and the drive disengaged. *(Steps **2** and **3**).*

2 Engage the parking brake.

⚠ CAUTION

The parking 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.
Whenever the parking brake has been used in an emergency, always renew both brake pads.
4-2-1-1/2

***Note**: An audible alarm will sound when the parking brake is engaged with the machine in forward or reverse drive. The alarm will stop when the drive is disengaged (see Step **3**).*

3 Set the forward/reverse lever to neutral.

4 Retract and lower the boom, rest the forks flat on the ground.

***Note:** Do not leave a 3-stage boom machine with the boom fully elevated and at full extension. This can allow oil to seep past one of the makeup valves and cause the boom sections to become out of phase. This will damage the boom hose management system when the boom is retracted.*

⚠ CAUTION

The efficiency of the rams will be affected if they are not kept free of solidified dirt. Clean dirt from around the rams regularly. When leaving or parking the machine, close all rams if possible to reduce the risk of weather corrosion.
INT-3-2-10

5 Lock the controls, *see **Control Lever Lock Options** (this section).*

6 If you are leaving the machine, make sure that all switches are set to off. If necessary, leave the hazard warning lights and/or side lights switched on. Remove the starter key.

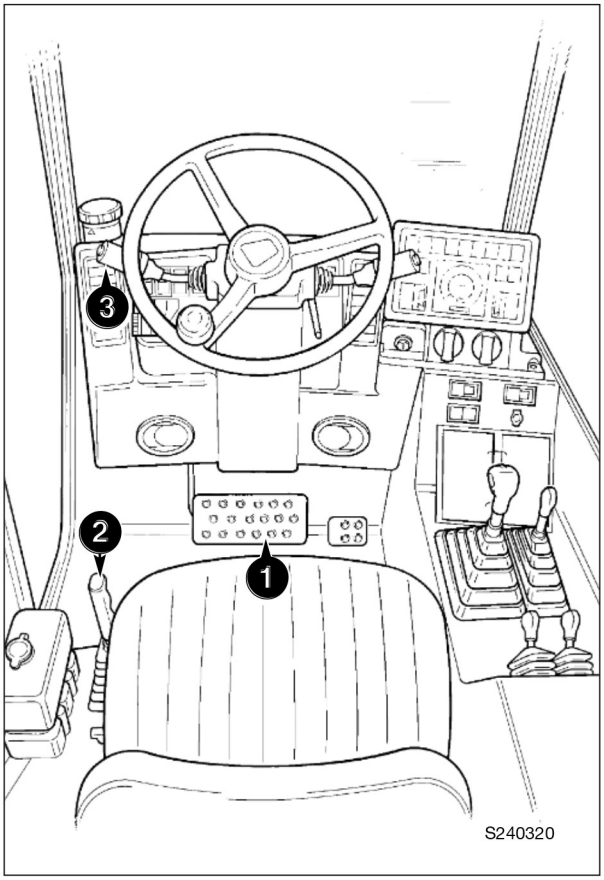
It is recommended that turbo-charged engines are run at 1000 RPM (approx) and reduced load for 2-3 minutes before shut down. This will allow the turbo-charger to cool.

7 Use the handholds and steps when you climb down from the machine. If you are leaving the machine, close and latch all windows and lock the door. We also recommend that the fuel filler cap is locked on.

⚠ WARNING

Always face the machine when entering (and leaving) the cab. Make sure your shoes and hands are clean and dry. Otherwise you could slip and fall.
2-2-1-3

8 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, *see **Battery** (MAINTENANCE section).*



USING THE LOAD CHARTS AND BOOM INDICATORS

The Safe Working Load (SWL) of the machine depends on how far the boom is extended and the angle it is raised to.

The machine is fitted with boom indicators **A** and **B**. The machine may also be fitted with a Safe Load Indicator (SLI) or Load Moment Indicator (LMI). *See **Safe Load Indicator*** or ***Load Moment Indicator** (OPERATION section).*

The following explanation is for the Boom indicators and load charts.

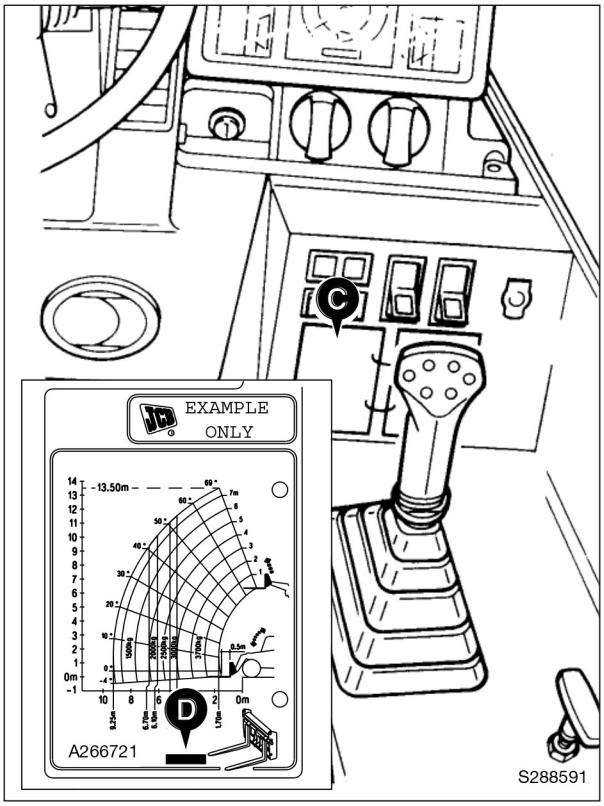
The SWL at different boom positions is shown on the load charts **C** in the cab. Boom angle and extension indicators are installed on the boom itself. Boom extension is indicated by numbered labels **A**. The numbers represent boom extension in metres. Boom angle is indicated by an indicator **B**. It has a scale marked in degrees.

The load charts show how far you can raise and extend a load without exceeding the safe working load. Each machine model has its own load chart for a standard fork carriage, and alternative charts for use when stabilisers or chassis levelling (sway) options are used. There may be other load charts for use when a different carriage or attachment is fitted on the boom.

Load charts are shown in this book for reference only. ALWAYS refer to the charts in the cab before lifting or placing a load. *See **Load Charts** (SPECIFICATIONS section).*

Check the relevant load chart is available for any alternative carriage or attachment. Where appropriate, the load chart shows the part number **D** of the carriage or attachment it refers to. If you are unsure of the correct load chart to use, contact your JCB distributor for advice.

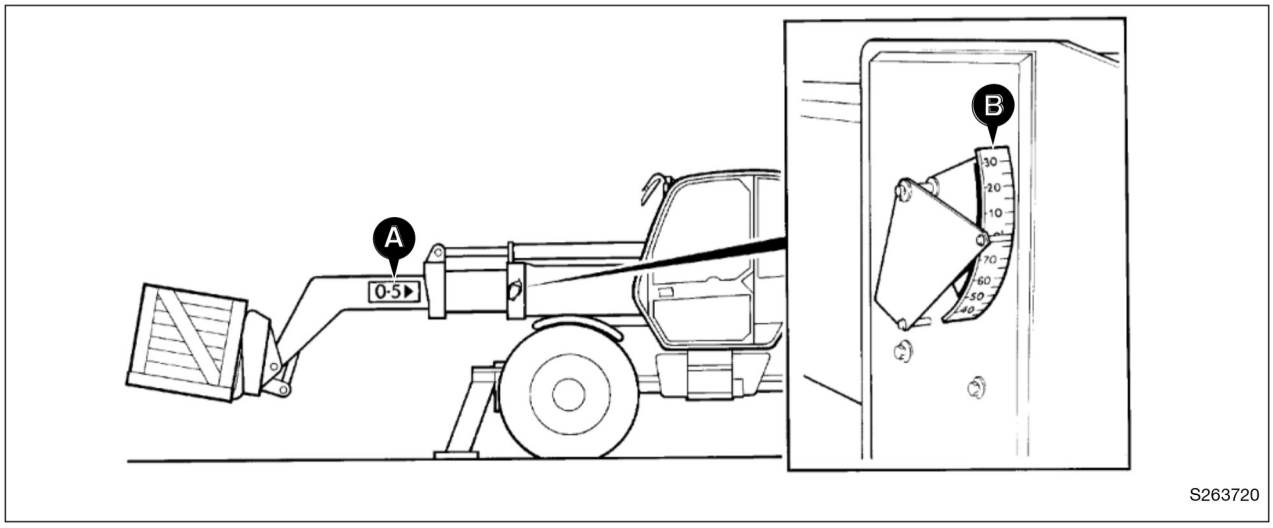
Renew any damaged or missing charts.



⚠ CAUTION

The Load Chart shown is only an example. Do not use it to find the loading limits on your machine. Before lifting or placing loads, refer to the Load Charts in the cab of your machine.

5-2-4-2



USING THE LOAD CHARTS AND BOOM INDICATORS (continued)

⚠ CAUTION

The limits shown on the Load Charts are for a stationary level machine. Do not raise or extend the boom while the machine is moving. Retract the boom fully and lower it as far as possible before travelling with a load.

5-2-4-3/1

1 Check what boom attachment is fitted to your machine, then turn to the correct Load Chart in the cab.

2 You must know the weight of a load before picking or placing it. Check that the loads Centre of Gravity **X** will not be more than 500 mm (20 in) in front of the fork uprights.

Note: the load's centre of gravity **Y** may not be in the middle of the load. You will have to find out where it is.

3 When you know the weight of the load, look on the Load Chart and find the coloured segment with the next highest weight.

For example, on the example Load Chart shown, if your load weight is 1800 kg, find the 2000 kg segment. This is the Maximum Load Segment for your load.

The left-hand edge **D** and the upper edge **E** of this segment show the machine stability limits for your load. You must not angle or extend the boom beyond these limits.

4 After inserting the forks beneath the load, **and before lifting the load**, check the readings on the boom angle and extension indicators. Find the same readings on the Load Chart.

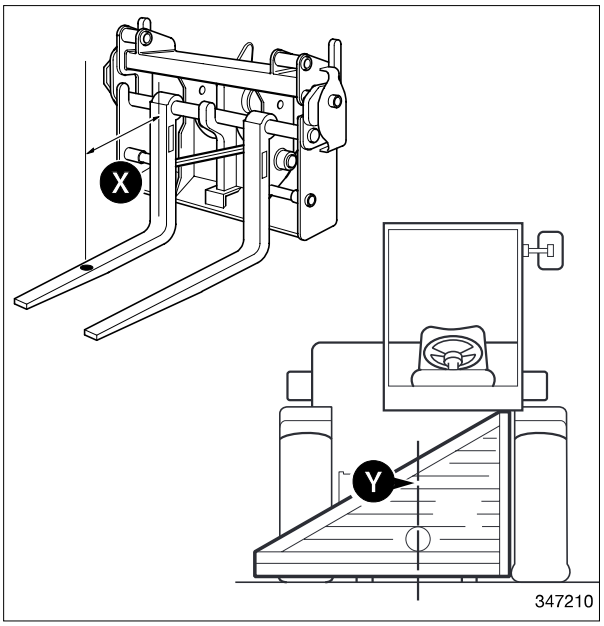
You will see on the chart that lines run from the boom angle and extension scales, through the coloured area of the chart. Find where the lines for your readings cross. If they cross inside your Maximum Load Segment or to the right of it (see Step **3**) the load is within safe limits.

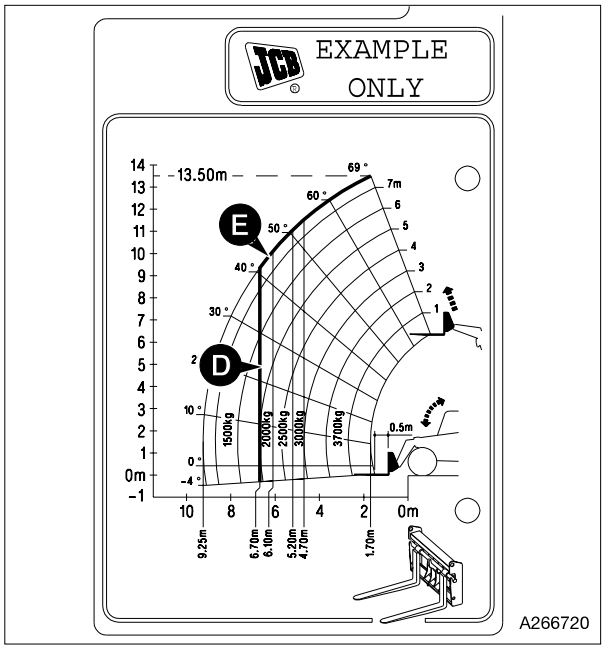
If the lines cross above or on the left of the segment, do not try to pick up the load. Withdraw the forks, retract the boom and try again. **If, even with the boom fully retracted, the boom angle and extension readings still cross outside your Maximum Load Segment do not try to lift the load.**

5 When the load is on the forks, **retract the boom before raising or lowering it**. This will reduce the risk of getting the machine unstable. While moving the boom, watch the boom angle and extension indicators. Keep inside the limits for your load.

Note that when the load is high up (*say on a scaffolding*) you will have to get it clear before fully retracting the boom.

6 Before placing a load, use the Load Chart to find how close you should get the machine to the unload point. You must be able to place the load without crossing the left-hand or upper boundaries of your Maximum Load Segment.





SAFE LOAD INDICATOR

Your machine may be fitted with a Safe Load Indicator (SLI). The SLI warns the operator when the machine is nearing its safe working limit (ie, when it could tip forward).

A sensor measures the pressure exerted on the rear axle and sends a signal to the indicator. The indicator then converts the signal into a display (in the form of a row of green **A**, amber **B** and red **C** lights).

As the effect of the load/reach increases, more of the green lights are illuminated. So the more lights that are showing, the closer the machine is to the safe working limit.

When all green and amber lights are lit, this means that the safe working limit has been reached. When the second amber light is illuminated, the whole display flashes. The first red light indicates when the Maximum Stability Limit is exceeded; the second red light will sound an audible alarm.

If this happens when a load is being lifted, move the load into a stable position. Then either move the machine closer (retracting the boom) or lighten the load.

⚠ WARNING

Look at the indicator lights frequently while lifting or handling loads. As more lights show, take extra care with control lever movements. Do not jerk the levers or make sudden changes of direction.
5-2-4-4

⚠ WARNING

The Safe Load Indicator shows only forward machine stability. Do not use it as a guide to the weight being lifted. Refer to the Load Charts in the cab.
5-2-4-5

⚠ WARNING

The readout display will be affected by extreme steer lock and extreme axle pivot angles. Before lifting a load, always ensure that the steering is not on full lock and that the rear axle is not fully pivoted.
5-2-4-13

Checking the Indicator

⚠ WARNING

The safe Load Indicator shows only forward machine stability. Do not use it as a guide to the weight being lifted. Refer to the Load Charts in the cab.
5-2-4-5

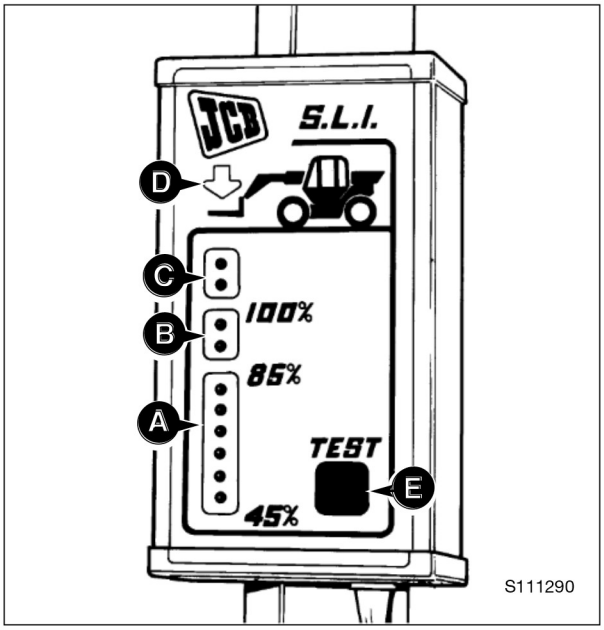
1 Stand the machine (unloaded) on level ground.

2 Set the starter switch to on. The red arrow **D** on the indicator should be lit.

3 With the engine running, press the test button **E**. All the lights should flash and the alarm should sound.

⚠ WARNING

If the Safe Load Indicator is faulty, contact your JCB Distributor. Do not try to repair it yourself.
5-2-4-6



LOAD MOMENT INDICATOR

The machine may fitted with a Load Moment Indicator (LMI). The LMI warns the operator when the machine is nearing its maximum working limit (ie, when it could tip forward).

A sensor measures the load exerted on the rear axle and sends a signal to the indicator. The indicator converts the signal into a display in the form of three green LEDs **A**, one amber LED **B** and one red LED **C**. The LEDs will illuminate progressively as the load increases.

All LEDs will flash as the load nears the maximum working limit. If this happens, move the load into a stable position by reducing the load, or retracting the boom.

If the load exceeds the maximum working limit, the red LED **C** will illuminate and an audible warning will activate.

If a system fault is detected, various combinations of LEDs will indicate a fault code. See **Diagnostic Fault Codes**.

The following checks and adjustments must only be done while the engine is running. Apply the parking brake and set the forward/reverse lever to neutral.

⚠ WARNING

Look at the indicator lights frequently while lifting or handling loads. As more lights show, take extra care with control lever movements. Do not jerk the levers or make sudden changes of direction.

5-2-4-4

⚠ WARNING

The Load Moment Indicator shows forward machine stability only. Do not use it as a guide to the weight being lifted. Refer to the load charts in the cab. The maximum working load indicated by the load moment indicator does not correspond to the SWL specified on the load charts in the cab.

5-2-4-14

⚠ WARNING

The readout display will be affected by extreme steer lock and extreme axle pivot angles. Before lifting a load, always ensure that the steering is not on full lock and that the rear axle is not fully pivoted.

5-2-4-13

Checking the Indicator

The Load Moment Indicator shows forward machine stability only. Do not use it as a guide to the weight being lifted. Refer to the load charts in the cab. The maximum working load indicated by the load moment indicator does not correspond to the SWL specified on the load charts in the cab.

5-2-4-14

1 Park the machine (unloaded) on level ground with the engine running. Apply the parking brake and place the forward/reverse lever in the neutral position.

2 The green LED **D** at the bottom of the display will illuminate to show that the indicator is receiving power.

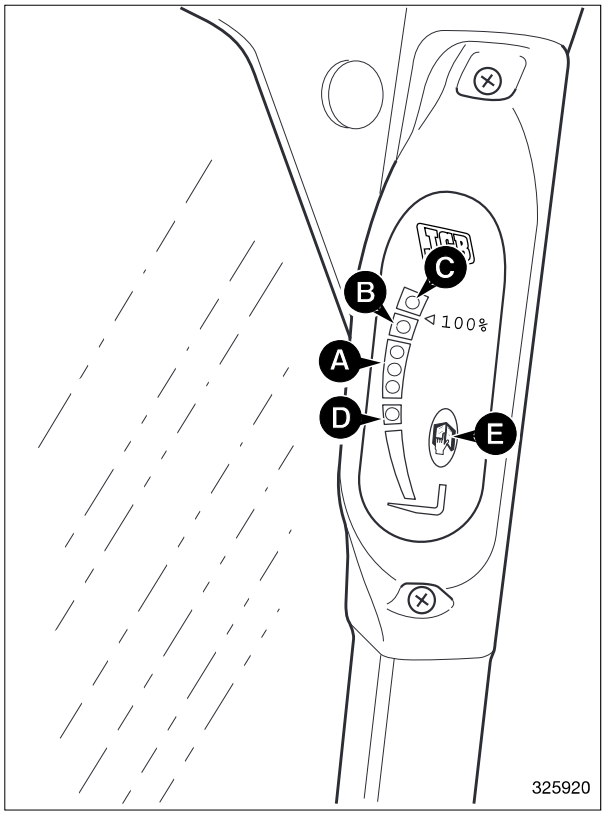
3 Press the display button **E** and release.

4 All LEDs on the indicator will flash and the audible alarm will sound if the unit is functioning correctly.

⚠ WARNING

If the Load Moment Indicator is faulty, contact your JCB distributor. Do not try to repair it yourself.

5-2-4-6



LOAD MOMENT INDICATOR

Setting the Volume and Brightness

The volume of the audible alarm, and the brightness of the display LEDs can be set by the operator using display button **E**. This allows the volume and brightness to be reduced for night time use. The possible options are:

(a) Full volume and full brightness (default setting)
(b) Reduced volume and full brightness
(c) Full volume and reduced brightness
(d) Reduced volume and reduced brightness

1 Park the machine (unloaded) on level ground with the engine running. Apply the parking brake and place the forward/reverse lever in the neutral position.

2 The green light **D** at the bottom of the display will illuminate to show that the indicator is receiving power.

3 Press and hold the display button **E**.

The display will cycle through the volume and brightness options, pausing for approximately three seconds to demonstrate each option.

4 Release the button during the required demonstration to select the option.

Note: the system will reset to the default setting when the starter key is switched to the off position.

Diagnostic Fault Codes

When the system detects a fault, the audible alarm will sound and various combinations of lights on the display will indicate a fault code for approximately 10 seconds.

The audible alarm and the fault code display cancel after 10 seconds and **ALL** LEDs on the display will flash continuously as long as the fault remains. Press and release display button **E** to show the fault code for a further 10 seconds.

When the fault clears, the display will return to normal.

⚠ WARNING

If the Load Moment Indicator is faulty, contact your JCB distributor. Do not try to repair it yourself.

5-2-4-6

Error Code 1 - Transducer signal fault
Transducer disconnected or wiring damaged.

Error Code 2 - Calibration out of range
System is incorrectly calibrated.

Error Code 3 - Calibration required
System not calibrated.

Error Code 4 - Display unit faulty
The display box has detected an internal error.

Error Code 5 - Low battery voltage
Battery voltage is below 9 Volts.

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If any of the above fault codes are displayed, switch the starter key off and on again. Contact your JCB distributor if the fault does not clear.

WORKING WITH THE MACHINE

Introduction

This section explains some techniques and procedures for using the machine efficiently and safely.

However, there are a wide variety of situations in which a JCB Loadall may be used. Consequently, in all cases, the applicability of these notes must be determined by the person seeking to apply them, on the basis of his/her own judgement, in the light of the conditions in which use is intended and subject to all relevant statutory requirements.

Whilst the information in this section is given in good faith and in light of the best information available, JCB can accept no responsibility for the recommendations, advice, statements, opinions and conclusions expressly or by implication set out below and gives no warranty or representation of assurance in respect of the accuracy of the same.

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.

With a careful, well trained and experienced operator, a JCB Loadall 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.

⚠ DANGER

Factors affecting machine stability include size and type of load, angle of elevation, the distance the boom is extended, ground condition and wind speed and direction.

It is the responsibility of the operator to assess the wind conditions and size of load before operating the machine.

It is the responsibility of the operator to assess the terrain, surface roughness, firmness of ground (remember that when wet, the ground will not support the same loads as when dry) before operating the machine.

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Read and understand this section and **Using the Load Charts and Boom Indicators** before you start working with your machine. Practice with it until you know exactly where the controls are and what they do.

Practice with palleted loads first. Do not handle awkward loads until you can handle palleted loads safely and confidently.

This section deals with machines fitted with standard fork carriages. Operating information for other attachments is given in *OPTIONAL ATTACHMENTS* section.

Before using any attachment, consider how the attachment is going to affect operational safety. With the attachment fitted, there may be changes in the machine's centre of gravity or overall dimensions. This could have an effect on, for example, machine stability, the gradients on which it is safe to operate or the safe distance from power lines.

The maximum wading depth of this machine is 400mm (16in). Water can enter the engine and axles, and the cooling fan can be damaged if the machine is operated in deeper water.

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

Read ***Operating Safety*** *in INTRODUCTION section*, plus the following information.

Safety Practices

Clothing & Safety Equipment

Do not wear loose clothing or jewellry 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.

Carrying a Load

Make sure that any location where a load is to be placed is strong enough to hold the weight of the load.

Look in the direction of travel and keep a clear view of the way ahead. Seek assistance if forward vision is obscured by a bulky load.

Particular care is required when driving off level ground, see ***Use of Machines on Gradients or Slopes*** *(OPERATION section)*.

Do not carry stacked loads that are higher than the fork carriage.

Drive at a speed consistent with conditions. Slow down when travelling on wet, slippery or loose surfaces.

Drive with care to minimise bouncing over rough surfaces. This can result in loss of load.

WORKING WITH THE MACHINE

Risk Assessment

It is the responsibility of the competent people planning the job and operating the machine to make judgement as to the safe use of the machine, having taken 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 complies with any safety precautions that the assessment identifies.

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

Some, but by no means all, of the factors to take into consideration are listed below.

General

An area selected as a loading/unloading area should be large enough to accomodate all the wheels of the Loadall and stabilisers (if fitted). It should not be necessary for the machine to make tight turns with an elevated load.

The area should be of consolidated firm ground, capable of accepting the weight of the machine and its load without significant deformation. Ideally, it should be substantially level in both planes, that is no gradient of more than 2.5% (1 in 40) in either plane.

However, a Loadall may safely be used for loading/unloading operations in areas which are not substantially level provided that its design capabilities are not exceeded and that the operator is satisfied that no part of the operation is outside the scope of his/her training and experience.

The capabilities of the Loadall are extended if the machine is fitted with stabilisers or sway control.

Traffic routes should be of consolidated firm ground with no gradient more severe than the following:

Maximum up slope	15% (1 in 7)
Maximum down slope	15% (1 in 7)
Maximum lateral slope	15% (1 in 7)

These figures apply only to a Loadall in its normal travelling mode, that is with boom retracted and with the upper surface of the heels of the fork arms not more than 500mm (20in) above mean ground level, and travelling no faster than walking pace. Particularly in the case of a lateral slope, some form of restraint on the load may be necessary.

Personnel

Are all persons who are going to take part in the operation adequately trained, experienced and competent? Are they fit and adequately rested? A sick or tired operator is a dangerous operator.
Is supervision needed? Is the supervisor adequately 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 rectified?
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?

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 whilst being moved? If so, can it be secured on the forks?

Loading/unloading area

Is it level? Any gradient of more than 2.5% (1 in 40) should be carefully considered.
Is more than one direction of approach to the load possible? Approaching across the gradient should be avoided, if possible.
Is the ground firm? 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 vicinity, for example, debris, excavations, man-hole covers, power lines?
Is the space adequate for safe manoeuvring?
Are any other vehicles or persons likely to be in or to enter the area whilst operations are in progress?

WORKING WITH THE MACHINE

Risk Assessment (continued)

The route to be traversed

How firm is the ground, will it provide adequate traction and braking?

How steep are any gradients, up/down/across? Cross gradients are 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 firm and smooth when dry will become uneven and slippery when wet, and it will not offer the same conditions for traction, steering or braking.

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

An adequate risk assessment depends on the TRAINING and EXPERIENCE of the operator. DO NOT put your life or the lives of others at risk.

Lifting and Loading Operations

Ensure that all local and national legislation governing operations such as lifting and loading are fully satisfied before operating the machine. This should include the selection of the correct model of machine for the operation, and the planning of the lifting operation itself.

As an example, in the United Kingdom, the following publications are relevant (this list is not exhaustive):

Safety in working with lift trucks (HS66) HSE 1999 ISBN 0-7176-1781-5

Rider operated lift trucks - Operator training Approved Code of Practice and Guidance HSE 1999 ISBN 0-7176-2455-2

Hand signals

BS 5744:1979	Code of practice for safe use of cranes
BS 6736:1986	Code of practice for hand signalling in agricultural operations
BS 7121:1989	Code of practice for safe use of cranes
CP 3010:1972	Code of practice for safe use of cranes

BITA Operators Safety Code for Rough Terrain RTTHs

BITA Stability Awareness Guidance for Powered Industrial and Rough Terrain RTTHs

Provision and Use of Work Equipment Regulations 1998, Regulation 9

Health and Safety at Work Act 1974

Management of Health and Safety at Work Regulations 1992

Construction (Health, Safety and Welfare) Regulations 1996

Construction (Design and Management) Regulations 1996

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER 98)

Working platforms on fork-lift RTTHs - HSE Guidance Note PM 28 Second Edition

Note: HSE Guidance Note PM 28 states that Rough Terrain trucks with a lift height of more than 6 metres are not suitable for Working Platforms unless they meet the safety requirements similar to a Mobile Elevated Work Platforms made to BS 7171 or equivalent. As this requirement is open to interpretation, we advise that users intending to use a working platform on a Loadall should contact their local HSE inspector for advice.

Further information concerning the safe use of lifting and other equipment in the UK is available from the HSE information line on **0541 545500** or on the world wide web at:

http://www.open.gov.uk/hse/hsehome.htm

Other countries and territories have their own legislation similar to the above. Be sure that you are aware of all local and national legislation governing lifting and loading operations where you are operating.

WORKING WITH THE MACHINE

Safety Warnings

⚠ WARNING

Before you start using the machine, inspect the job site. 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.

5-2-3-4

⚠ DANGER

Under no circumstances should personnel be lifted into the air without using an approved and properly secured platform. Failure to follow this warning could result in death or serious injury.

0004

⚠ CAUTION

Travelling too fast or with the load too high can make the machine tip over. Keep the load close to the ground when travelling.

Do not go faster than walking pace when the machine is carrying a load. DRIVE CAREFULLY OVER BUMPS AND CURBS

Do not operate the boom/carriage controls while the machine is moving.

5-2-3-5

⚠ WARNING

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

INT-2-2-5

⚠ WARNING

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

INT-2-2-8

⚠ CAUTION

Make sure you know the weight of the load before trying to lift it. Raise the load only a few centimetres at first, to check that the machine is stable. Lower the load straight away if the machine begins to feel unstable.

If the machine feels unstable when the boom is raised and extended, always retract the boom before lowering it.

Do not exceed the loading limits shown on the Load Charts *(see Using the **Load Chart and Boom Indicators**, in OPERATION section).*

5-2-3-6

⚠ CAUTION

Loading and unloading on soft or uneven ground can be hazardous. The machine could tip over and you could be killed or injured. Make sure that the ground is level and firm before loading and unloading. Whenever possible, avoid soft or uneven ground when carrying a load.

5-2-3-7

⚠ DANGER

You can be electrocuted if you get your machine too close to live electrical power lines. Before starting work, find out if there are electrical power lines on the job site. If there are, contact the local electricity supplier and ask what safety precautions you must take. Also find out if there are any local laws and regulations concerned with work near electrical power lines.

When you have found out what safety precautions, laws and regulations apply to the job site, make sure they are all obeyed.

5-2-4-1/1

⚠ CAUTION

Loads can fall off incorrectly spaced forks. Always space the forks correctly for the load. Make sure the forks are completely under the load before lifting.

5-1-4-2

⚠ CAUTION

A load lifted on one fork can slip off. Never lift a load with one fork.

5-1-4-3

⚠ CAUTION

Never unload the forks by stopping the machine suddenly. Follow the procedures in this handbook for unloading.

5-1-4-4

⚠ WARNING

DO NOT exceed the total rated load capacity of the forks being used. Forks can break resulting in a loss of load and possible injury.

0003

⚠ WARNING

Maintain correct tyre pressures to avoid upsetting the lateral stability of the machine. Inspect tyres daily for signs of damage, cuts or embedded objects which could cause loss of pressure.

0005

WORKING WITH THE MACHINE

Fork Ratings

⚠ WARNING

DO NOT exceed the total rated load capacity of the forks being used. Forks can break resulting in a loss of load and possible injury.

0003

JCB approved forks for this machine are marked with a maximum load capacity rating **A**. The rating shows the maximum load capacity in kilograms (kg) that the forks can carry safely at the maximum load centre **B** of 500mm (20 inches).

The total load rating for two forks will be the addition of their single rated capacity.

Forks must be used in matched pairs.

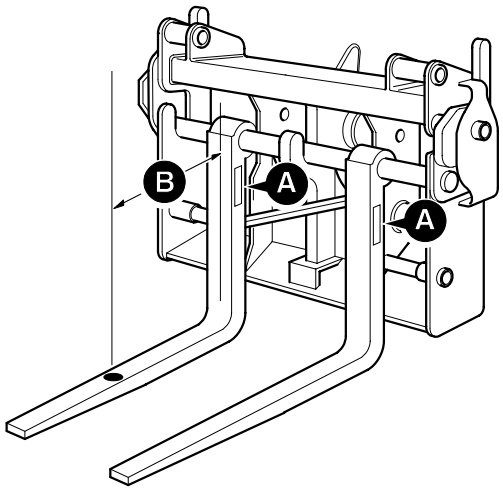
The maximum rated load capacity of the machine is shown in **Performance Dimensions** (SPECIFICATIONS). The forks used on this machine must have a total load rating which is equal to, or exceeds the rated load capacity of the machine.

If the load rating of the machine is different to the load capacity of the forks, the lower value must be used as the overall load capacity.

IMPORTANT: All lifting equipment, including forks and their mountings, may need regular inspection and testing by a competent person to ensure they are fit for purpose.

This may be needed every six months or at least annually in some countries to meet and comply with local legislation and for insurance purposes.

Check with your local JCB distributor for further advice.



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WORKING WITH THE MACHINE

Handling Palleted Loads

⚠ CAUTION

Load and unload on firm, level ground. Always be alert for possible hazards. Take special care when turning or reversing.

5-2-4-7

⚠ WARNING

Make sure you know the weight of the load before lifting or placing it.

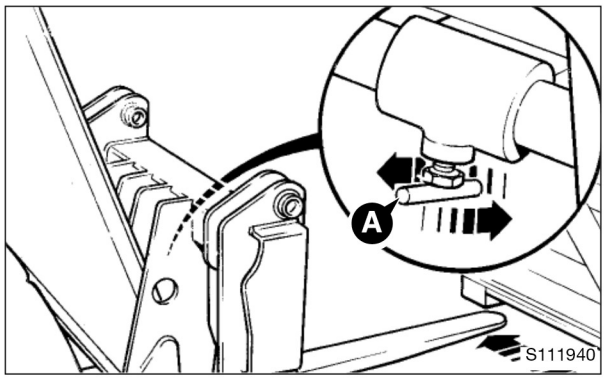
Do not exceed the Safe Working Load of your machine. Do not angle or extend the boom outside the limits shown on the Load Charts in the cab. *See* ***Using the Load Charts and Boom Indicators*** *(in OPERATION section).*

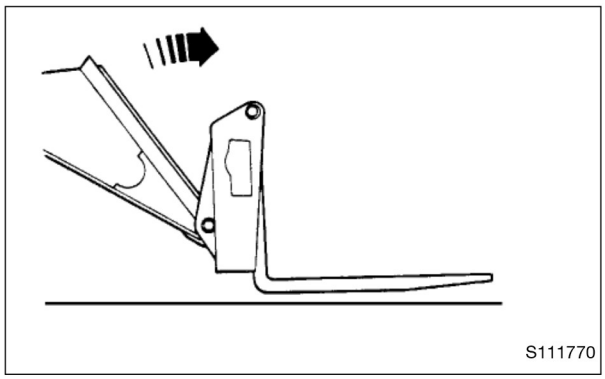
5-2-4-8

⚠ WARNING

Forks are heavy. Take care when spacing the forks or folding the forks back.

0002





Loading

1 Space the forks as wide as possible to suit the load. Tighten the fork clamping screws **A**.

2 Put the forks in the horizontal position. Fully retract the boom.

3 Approach the load straight-on, not at an angle, with all wheels straight. Stop the machine, leaving enough room to manoeuvre the boom. Engage the parking brake. Put the transmission in neutral.

Note*: If the load is on a high platform you may have to raise the boom to allow you to get the machine close enough to the load.*

4 Extend the boom, or drive the machine, to insert the forks under the load. Stop when the carriage just touches the load. Check the boom extension/angle, make sure they are in limits.

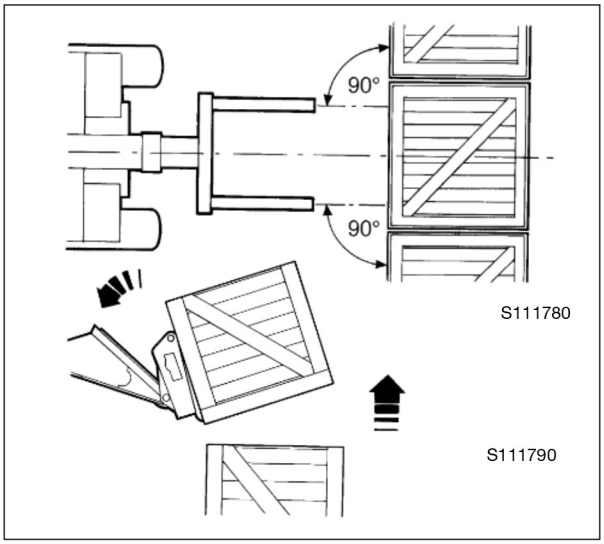
⚠ WARNING

If the machine starts to feel unstable when you begin lifting the load, lower the load immediately.

5-2-4-9

5 Raise the load slightly. Tilt the carriage back. Retract the boom fully and lower it into the travel position.

6 Carefully drive the machine to the unloading point.



WORKING WITH THE MACHINE

Handling Palleted Loads (continued)

Unloading

⚠ CAUTION

Load and unload on firm, level ground. Always be alert for possible hazards. Take special care when turning or reversing.
5-2-4-7

⚠ WARNING

Make sure you know the weight of the load before lifting or placing it.

Do not exceed the Safe Working Load of your machine. Do not angle or extend the boom outside the limits shown on the Load Charts in the cab. *See **Using the Load Charts and Boom Indicators** (in OPERATION section).*
5-2-4-8

1 Approach the unload area on centre, with all wheels straight. Stop the machine, leaving enough room to manoeuvre the boom. Make sure you will not exceed the loading limits shown on the Load Chart.

2 Engage the parking brake. Put the transmission in neutral.

3 Position the load just above its required position. If stacking box pallets, ensure that the stack is straight and square. For extra stability, stagger the top row.

4 Lower the load into position. Make sure the load is level.

5 Carefully withdraw the forks. Depending on the height of the load, you may have to raise or lower the boom as the forks come out.

6 When the forks are clear of the load, fully retract the boom. Lower the boom into the travel position.

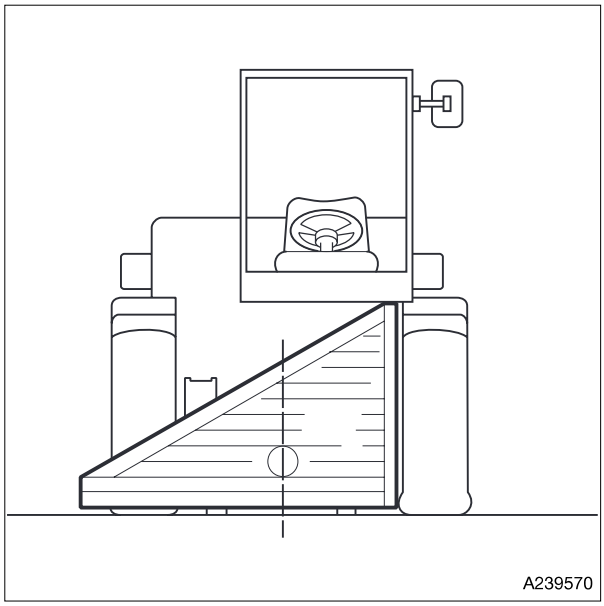
Uneven Loads

1 Find the load's Centre of Gravity. On packaged loads it may be marked on the box.

2 Position the machine so that the load's centre of gravity is halfway between the forks.

3 Pick/Place the load, this will depend on what kind of load it is. If it is palleted, follow the procedure for palleted loads. If it is not palleted, it may be necessary to secure the load to the forks using suitable chains. Stop the engine before allowing anyone to approach the forks.

***Note**: If you cannot find out the load's centre of gravity, do the following: Make trial lifts at different positions until you are sure the load is stable on the forks. Do not raise the load more than a few centimetres when you make the trial lifts.*
Use extra caution when operating the boom and carriage with an uneven load.



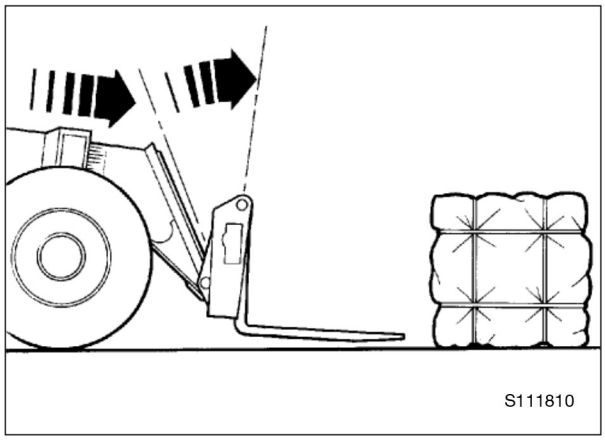
WORKING WITH THE MACHINE

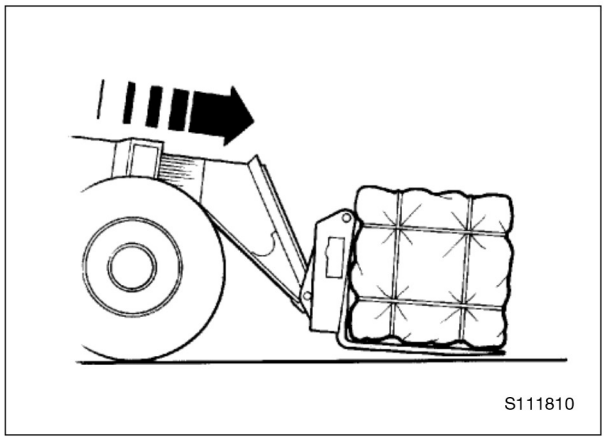
Lifting Bales

Handle bales only after you fully understand how to handle palleted loads. The basic procedure is the same, but remember the following points:

1 Lower the boom and tilt the carriage forward as shown.

2 Extend and slightly raise the boom to insert the forks under the load. Tilt the carriage back. Put the boom in the travel position.





Placing Bales

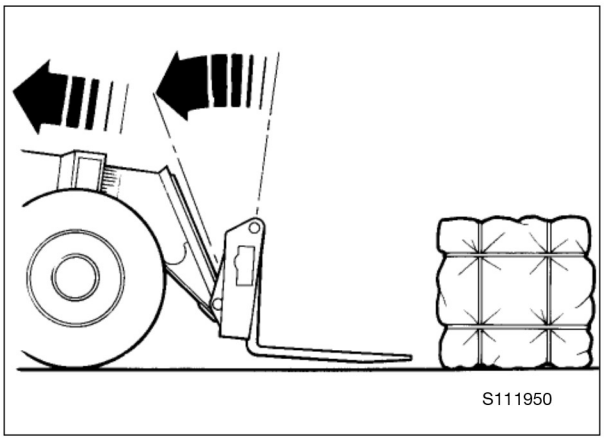
1 Position the boom so that the bale is directly above its required position. Lower the boom and tilt the carriage forward slightly, so that the forward edge of the bale rests on the ground.

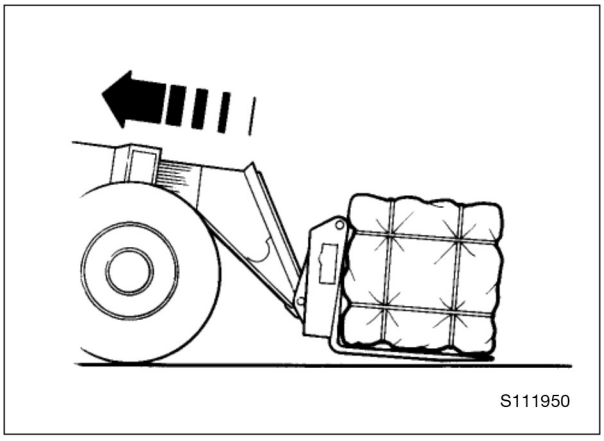
2 Retract the boom, withdrawing the forks from under the bale. When the forks are clear, return the boom and carriage to the travelling position.

⚠ WARNING

The bale may have to be manhandled off the forks. If so, stop the engine before allowing anyone to approach the forks.

5-2-4-10





WORKING WITH THE MACHINE

Working With a Shovel

⚠ WARNING

Make sure you know the weight of the load before lifting or placing it.

Do not exceed the Safe Working Load of your machine. Do not angle or extend the boom outside the limits shown on the Load Charts in the cab. *See **Using the Load Charts and Boom Indicators** (in OPERATION section).*

5-2-4-8

⚠ WARNING

When loading with material from a high bank or pile, remove any overhang first. Watch out for sliding material. If overhanging material falls, you and your machine could be buried.

2-2-6-3

⚠ CAUTION

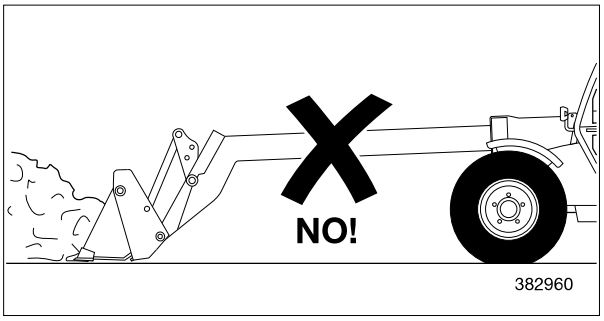
Load and unload on firm, level ground. Always be alert for possible hazards. Take special care when turning or reversing.

5-2-4-7

⚠ CAUTION

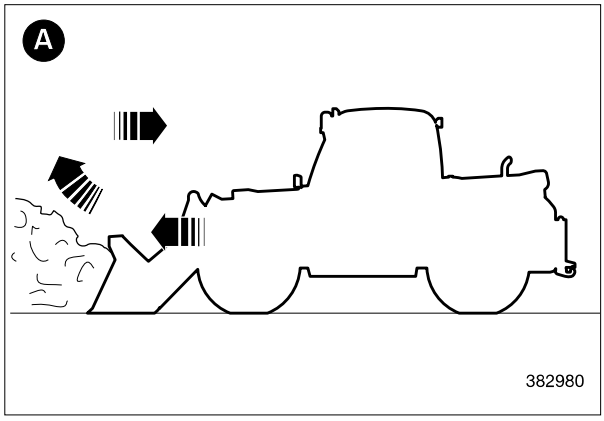
Do not load a shovel with the boom extended. This may cause serious damage to the boom.

0070



The JCB Loadall may be used with a wide variety of attachments, including shovels, see ***Optional Attachments***. The following paragraphs are intended to bring some of the relevant considerations to your attention. They are not intended to be comprehensive, nor to be a substitute for adequate training. Make sure you are trained before using any attachment.

As the shovel enters the pile, start rolling the shovel back while raising it at the same time. This will sweep the shovel up the pile, gathering material as it goes.



Pressing the transmission dump switch will give more power to the loader and speed the operation. Try to fill the shovel in one pass. Half full shovels are less productive.

When moving with the load, roll the shovel right back to prevent spillage.

When you are loading from a pile of loose material, start at the bottom and follow up the face as shown at **A**. Approach the pile with the shovel level and skimming the ground.

In tightly packed material, start at the top and work down.

When removing material from a stockpile, start at a shovel's height from the base. Once the height of the stockpile has been reduced, begin loading from the base.

WORKING WITH THE MACHINE

Working With a Shovel (continued)

Loading a Truck

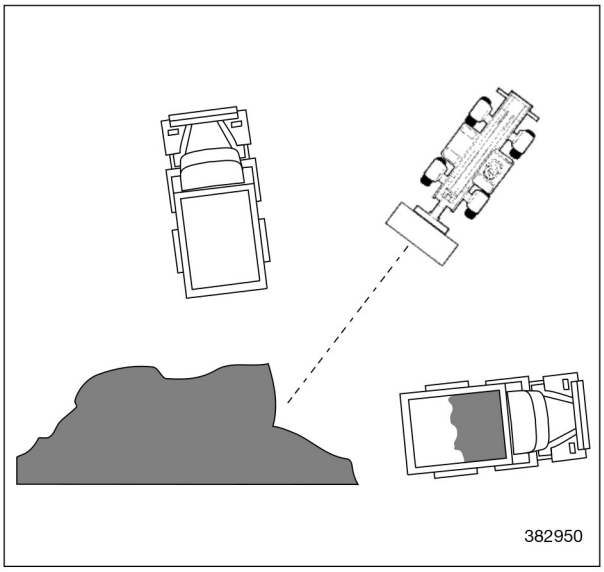
Put the truck(s) at an angle of about 45° to the pile, as shown. This cuts out unnecessary manoeuvring. Allow enough distance for the shovel to reach its unloading height while you are travelling, without slowing down.

Keep the wind on your back. This keeps dust away from you and your machine.

Move your machine as close as possible to the truck before unloading.

If the truck body is about as long as a shovel's width, tip the load into the centre of the truck. If the truck is two shovel-widths long or more, load the front of the truck first.

Do not dump the material in one sudden movement. Roll the shovel forward in stages until it is empty. Use the control lever to rock the shovel back and forth to loosen any sticky material



WORKING WITH THE MACHINE

Use of Machines on Gradients or Slopes

⚠ WARNING

Ensure that you have been trained and are familiar with the use of machines on gradients, and understand the adverse affects that gradients and site conditions can have on stability. Never use the machine on a gradient if you do not understand the recommended practices for the use of machines in such applications.
0017

There are a number of factors which can adversely affect the stability of the machine and the safety of the machine and operator when used on a gradient.

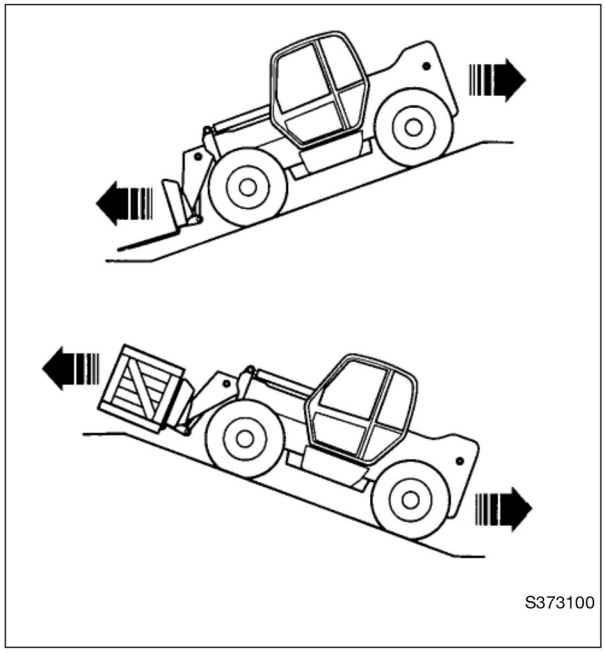
It is essential that a risk assessment of the work to be done is completed, see ***Risk Assessment*** *OPERATION section*, and that the operator complies with any safety precautions that the assessment identifies.

Driving Up and Down Gradients

To ensure maximum traction do the following when driving on a gradient.

Drive an unladen machine forward down a gradient and in reverse up a gradient .

Drive a laden machine forward up a gradient and in reverse down a gradient.



Driving Across Gradients

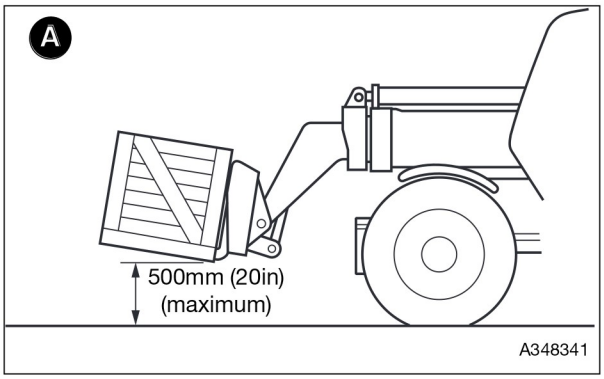
Read and understand the instructions in this handbook before travelling across a gradient.

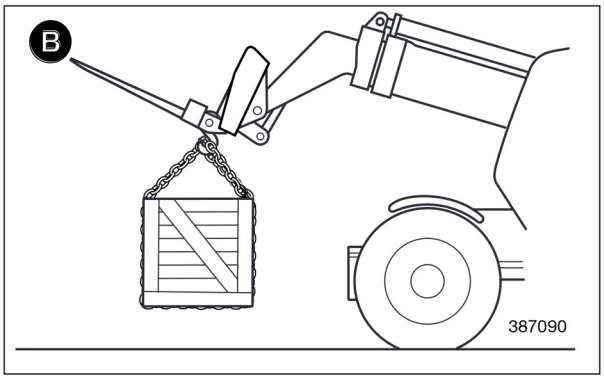
Maximum stability is achieved when the machine is operated on firm level ground. Stability will be reduced when the machine is operated on a cross gradient.

When travelling across a gradient, fully retract the boom and travel slowly at walking pace.

Do not raise the carriage higher than necessary. This would normally be that the lowest point of the load is not more than 500mm (20in) above the ground, with a load which is carried on top of the forks, as shown at **A**. Some loads may be carried suspended below the forks, as shown at **B.** In this case, assess the risk involved before raising the carriage sufficiently to achieve ground clearance.

Remember, be CAREFUL, be SAFE. Your life, or the lives of others could be in DANGER if you take unnecessary risks.





WORKING WITH THE MACHINE

Lifting Operations on Gradients

⚠ WARNING

Conducting lifting operations on gradients can be dangerous. The machine can become laterally unstable and tip over if the instructions in this section are not followed and understood. You and others can be seriously injured or killed. Ensure you follow and fully understand the guidelines given in this handbook.
0019

Lifting operations should not be undertaken on gradients unless the machine is level across its width (ie. laterally level).

⚠ WARNING

Stop the machine and apply the parking brake before conducting any lifting operations.
0020

Longitudinal and lateral stability are two important safety factors that must be considered if the boom is to be extended, or raised by more than 500mm (20in) above the ground with the machine on a gradient.

Longitudinal Stability

Longitudinal (forward) stability is measured and shown by the Safe Load Indicator (SLI) or Load Moment Indicator (LMI), if fitted, in the cab. Read and understand the section describing the operation of the SLI or LMI before lifting with the machine. See ***Safe Load Indicator*** *or* ***Load Moment Indicator*** *(OPERATION section)*.

Always operate the machine within the longitudinal stability limits indicated by the load moment indicator (if fitted) or load chart.

Lateral Stability

Ensure you have taken into account all factors that may affect machine stability before a lifting operation is started when working on a gradient. See ***Use of Machines on Gradients And Slopes*** *(OPERATION section)*. Make sure the machine is level across its width to maintain lateral (sideways) stability.

Inclinometer **A** (if fitted) can be used to check if the machine is level. Some early machines were not fitted with an inclinometer on build. In view of the importance of machine lateral stability, JCB recommends that such machines have an inclinometer fitted at the earliest opportunity. See your JCB Distributor for details.

Level the machine by one of the following methods, depending on machine model and specification.

1 530, 532, 535, 537, 540-70 and 540-170 machines can be made level across their width using the sway control facility **B** (if fitted). See ***Chassis Levelling (Sway) Option (OPERATION section).***

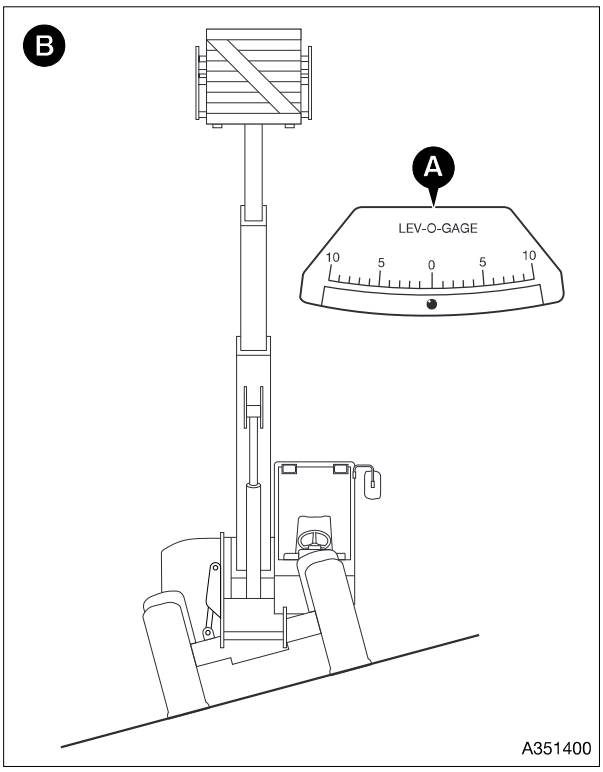
2 532, 537 and 540-170 machines can be made level across their width using the stabilisers **C**. See ***Stabiliser Control Option*** *(OPERATION section*).

3 If the machine is not fitted with either sway or stabilisers, reposition the machine, if possible, onto firm level ground as shown at **D**.

It is recommended that the machine should be operated on firm, level ground wherever possible for maximum machine stability. Where this is not possible, as shown at **E,** a risk assessment must be carried out by the operator before attempting a lifting operation, see ***Risk Assessment*** *(OPERATION section).*

WORKING WITH THE MACHINE

B



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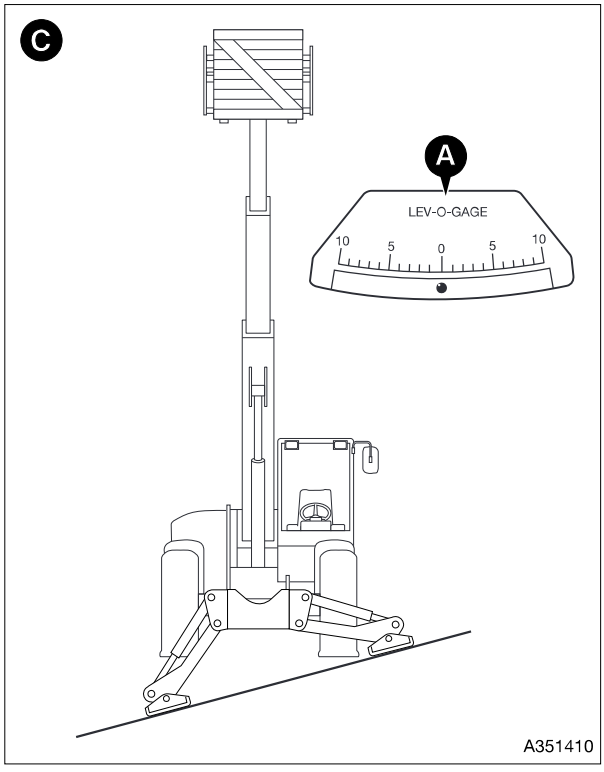

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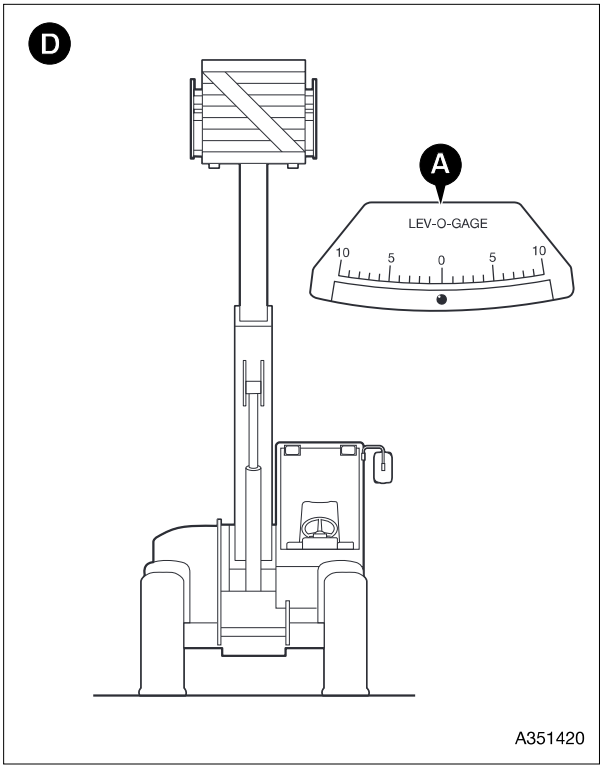

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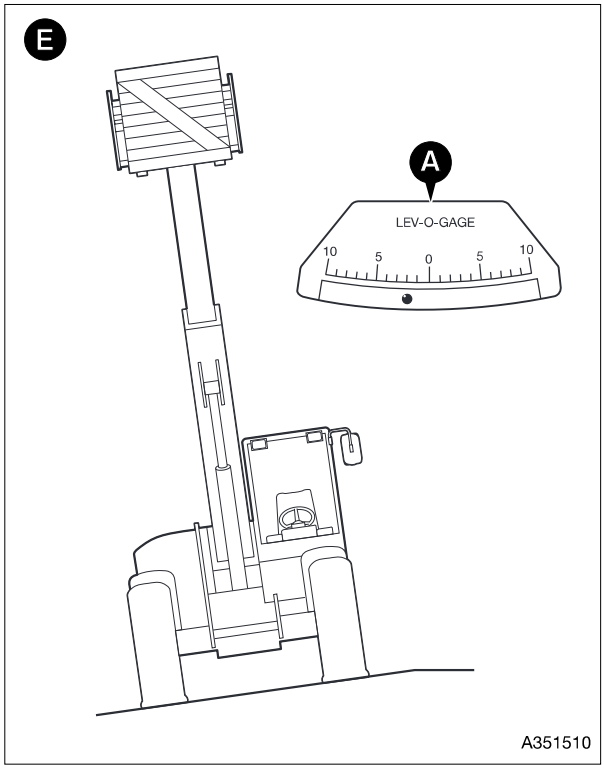

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OPERATING IN LOW TEMPERATURES

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

⚠ 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.
3-2-1-9

1 Use the correct viscosity engine lubricating oil. *See **Fluids and Lubricants - Capacities and Specifications** in MAINTENANCE section.*

2 Use a low temperature diesel fuel, if available. *See **Fuel System** in MAINTENANCE section.*

3 Use the correct coolant mixture. *See **Coolant Mixtures** in MAINTENANCE section.*

4 Keep the battery at full charge.

5 Fill the fuel tank at the end of each work period, to prevent condensation forming in the tank as it cools down.

6 Protect the machine when not in use. Park the machine inside a building or cover it with a tarpaulin.

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

***Note**: Do not connect two batteries in series to give 24 volts for starting. This could burn out the induction manifold heater and starter motor.*

8 Remove snow from around the engine compartment before starting otherwise snow could get into the air cleaner.

⚠ WARNING

A battery with frozen electrolyte can explode if it is used or charged. Do not use a machine with a frozen battery. To help prevent the battery from freezing, keep the battery fully charged.
INT-3-1-7

OPERATING IN HIGH TEMPERATURES

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

1 Use the correct viscosity engine lubricating oil. *See **Fluids and Lubricants - Capacities and Specifications** in MAINTENANCE section.*

2 Use the correct coolant mixture. *See **Coolant Mixtures** in MAINTENANCE section.*

3 Check the coolant system regularly. Keep the coolant at the correct level. Make sure there are no leaks.

4 Regularly remove dirt and debris from the radiator and the engine.

5 Check the engine pre-cleaner regularly. To remove dust and check the dust valve, *see **Engine Air Filter** in MAINTENANCE section.*

TOWING A MACHINE

Do not tow a machine unless there is no alternative. Remember that more damage might be caused to the machine by towing it. If at all possible repair the machine where it stands.

⚠ CAUTION

Towing a machine too far or too fast can damage the transmission. Do not tow the machine further than one mile. Use a trailer for greater distances. When towing do not travel faster than 25 km/h (15 mph).

Use a rigid drawbar. If you must use towing chains, then use two towing vehicles. One towing vehicle should be coupled to the front of the disabled machine. The other towing vehicle should be coupled to the rear of the disabled machine, to provide braking power.

The towing vehicle(s) must have enough pulling and braking power to move and stop the machine.
2-2-7-3

Preparation for Towing

1 Set the gear lever to neutral.

2 Prepare the machine for travel, *see* ***Preparing For Road Travel*** *in OPERATION section.*

If the engine cannot be run, the boom may have to be hoisted into the transport position and secured. The procedure for doing this will depend on the machine's condition and its hydraulic circuits.

For this reason you should contact your JCB distributor for help and advice before attempting this work.

3 Attach the drawbar to the front lifting eyes. The machine is now ready for towing. If you will be steering the machine, make sure you understand what the towing driver will be doing. Obey his instructions and all relevant regulations.

Remember that the steering will be heavier if the engine is not running.

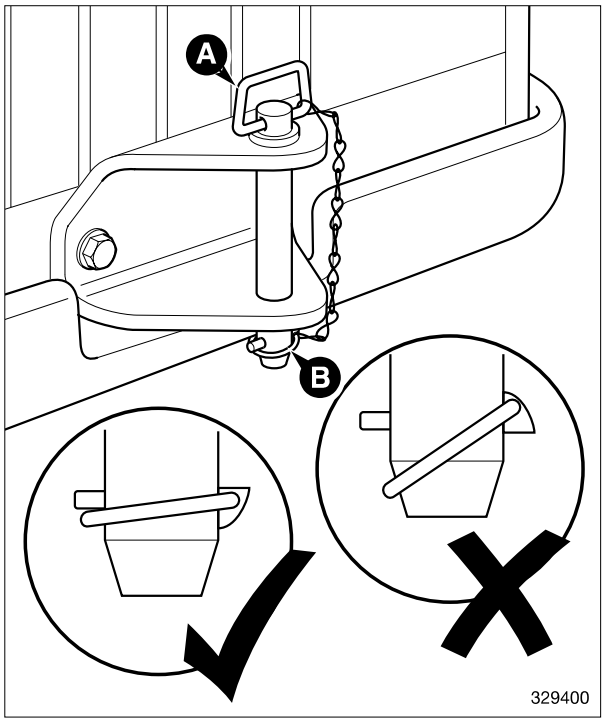
RECOVERY HITCH

The recovery hitch is only suitable for occasional off highway towing with a maximum pay load of 1 ton. It is not approved as a permanent towing hitch. Make sure you will be obeying all pertinent laws and regulations before towing.

⚠ WARNING

Using the recovery hitch for towing may exceed the capability of the recovery hitch. This could damage or weaken the recovery hitch or pin which can result in the trailer becoming detached from the machine.
2-2-4-10

1 Fit pin **A** and secure in position with locking ring **B**.



MECHANICAL TOW HITCH OPTION

Make sure you will be obeying all pertinent laws and regulations before towing.

Make sure that the trailer draw bar is suitable for your machine and has sufficient clearance to enable the machine to turn without fouling.

⚠WARNING

Examine the tow hitch and the trailer draw bar towing ring for signs of wear before each use. A badly fitting or worn hitch or towing ring could cause loss of the trailer and injury to yourself or other people.

0067

Use the following procedure to attach a trailer to the tow hitch.

1 Check the trailer weights and tyre pressures. The maximum towing capacity and correct tyre pressures for your machine are shown on a warning label in the cab. Make sure your tyre pressures are correct and that the loaded trailer does not exceed the maximum gross trailer weight of:

10 tonne (10,000 Kg.) - maximum 2 tonne (2,000 kg) imposed load on the hitch.

8 tonne (8,000 Kg.) - maximum 1.2 tonne (1,200 kg) imposed load on the hitch (Germany only).

⚠WARNING

Do not exceed the permitted limits on trailer gross weight or hitch load. The machine may become unstable.

0068

2 Engage the parking brake, *see* ***Cab Layout and Controls*** *in OPERATION section.*

3 Adjust the mirror(s) to obtain a good view of the tow hitch area.

4 If your machine is fitted with a switch-operated 2/4 wheel drive selector, you can tow in 2-wheel drive if required. But before towing in 2-wheel drive, you must check that the transmission changes automatically to 4-wheel drive when the brake pedal is pressed (i.e. that the **2-wheel drive selected indicator light** goes out).

5 The procedure for engaging the trailer to the tow hitch will depend on the type of trailer. In all cases observe the following precautions:

a Ensure that the trailer and its draw bars are correctly positioned for engagement before the machine begins to approach it.

b If a helper is available to manoeuvre the trailer he should stand well clear of the machine until the tow hitch is correctly aligned with the trailer towing eye.

c The helper should not approach the trailer or machine until the machine has been stopped, with the parking brake engaged and the engine switched off.

d Once the trailer has been engaged, fit pin **A** and lock in position as shown. The machine operator must not start the engine until the helper is clear of the machine and trailer.

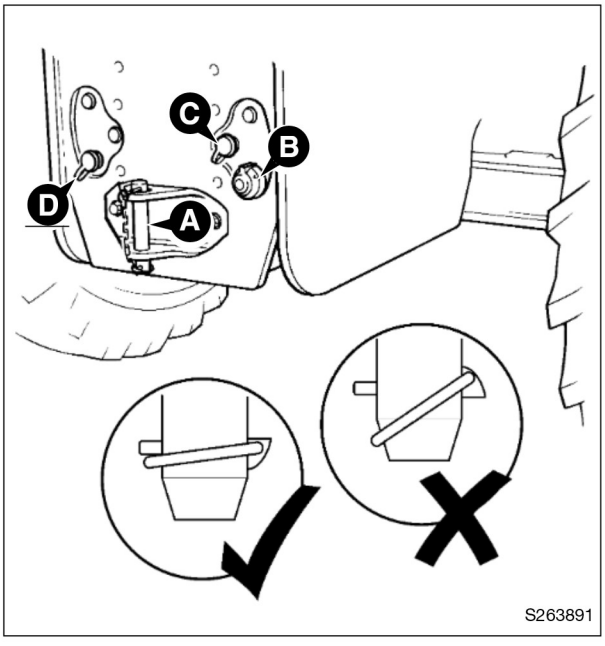
6 Connect the trailer lights into socket **B**. Make sure that all the trailer lights are working correctly and are visible by other road users.

Make sure the trailer lights and the direction indicator lights are working correctly.

7 Connect the trailer brakes option into socket **C**. Trailer braking is operated by the brake pedals.

Before travelling on the public highway check that the brakes work correctly and get used to the braking effect.

8 Connect auxiliary hose **D**.



MECHANICAL TOW HITCH OPTION

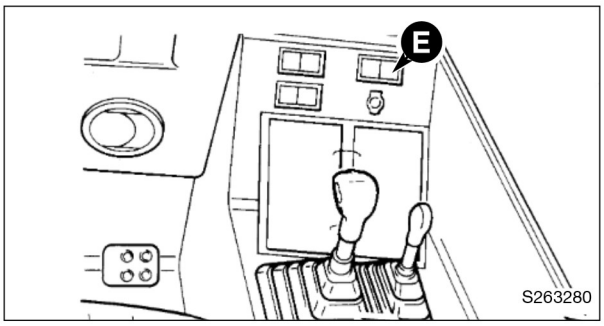
9 Hitch/Auxiliary selector switch **F** is fitted on later machines. If fitted, operate to select the hitch circuit, the switch lamp should extinguish.

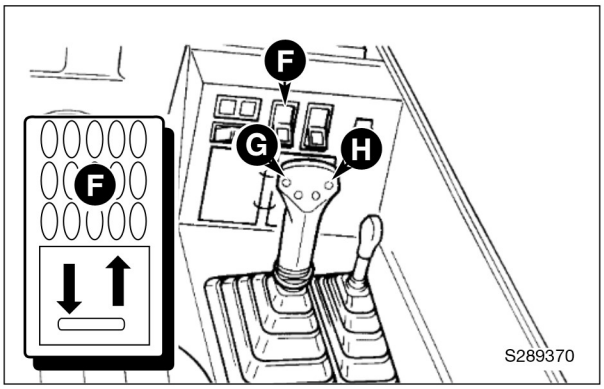
Note: *make sure the Hitch/Auxiliary switch lamp is working, ie. select* ***ON****.*

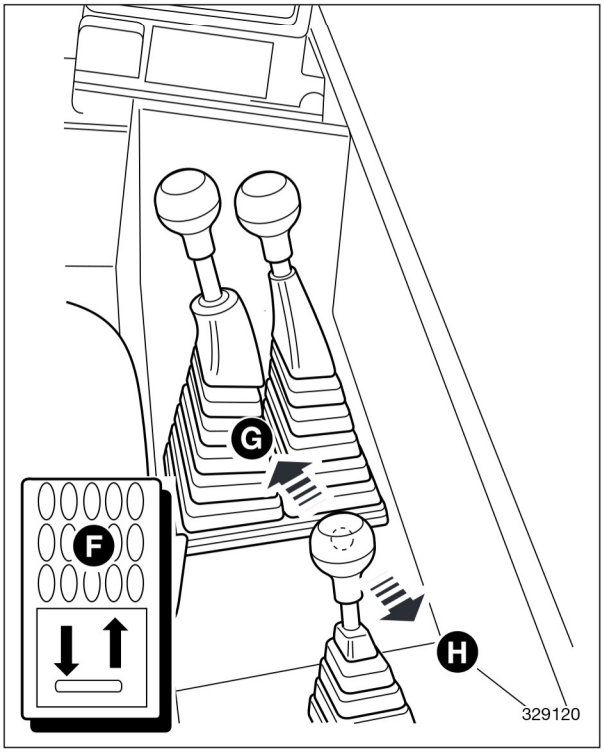
For auxiliary operation, ie. trailer tipping, operate either **G/H** or **E** depending on the attachment fitted and the function required.

10 To prevent contamination of the machine hydraulics, when using a tipping trailer leave the trailer flat before disconnecting the hydraulic service to exhaust the trailer ram of oil.

11 Select 2-wheel steer if towing on Public Roads. Make sure the indicator shows that 2-wheel steer has engaged. *See* ***Preparing For Road Travel*** *in OPERATION section.*







HYDRAULIC TOW HITCH OPTION

Make sure you will be obeying all pertinent laws and regulations before towing on public roads.

Make sure that the trailer draw bar is suitable for your machine and has sufficient clearance to enable the machine to turn without fouling. It is essential that the tow bar is parallel with the machine when the pickup hitch is raised and locked.

Check that the hitch locking lever, the release cable and return spring are not worn or damaged and operate smoothly.

⚠WARNING

Examine the tow hitch and the trailer draw bar towing ring for signs of wear before each use. A badly fitting or worn hitch or towing ring could cause loss of the trailer and injury to yourself or other people.

0067

Use the following procedure to operate the pickup hitch.

1 Check the trailer weights and tyre pressures. The maximum towing capacity and correct tyre pressures for your machine are shown on a warning label in the cab. Make sure your tyre pressures are correct and that the loaded trailer does not exceed the maximum gross trailer weight of:

10 tonne (10,000 Kg.) - maximum 2 tonne (2,000 kg) imposed load on the hitch.

(Germany only)
8 tonne (8,000 Kg.) - maximum 1.2 tonne (1,200 kg) imposed load on the hitch.

⚠WARNING

Do not exceed the permitted limits on trailer gross weight or hitch load. The machine may become unstable.

0068

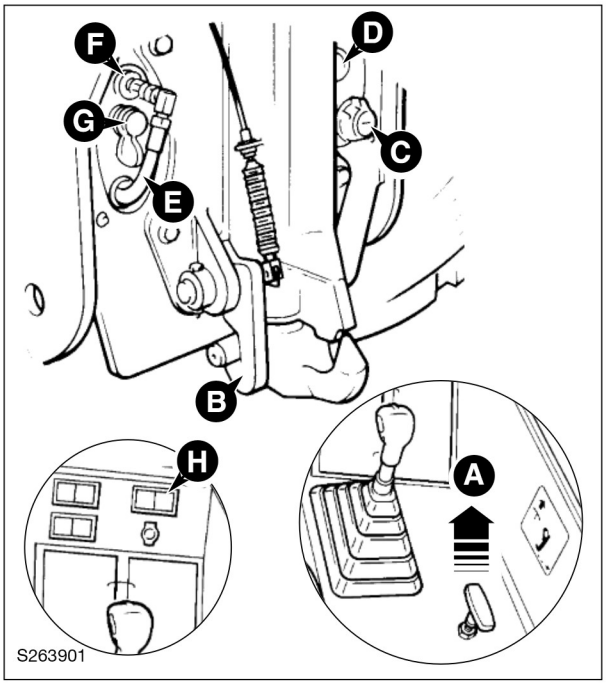
2 Engage the parking brake, *see **Cab Layout and Controls** in OPERATION section.*

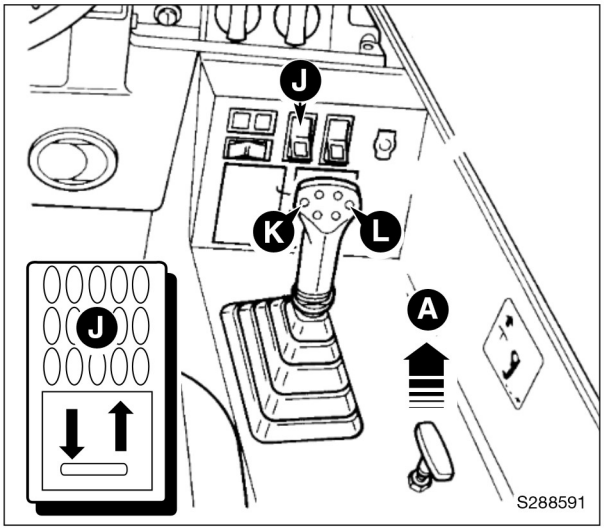
3 Adjust mirror(s) to obtain a good view of the pickup hitch.

4 Your machine is fitted with a switch-operated 2/4 wheel drive selector, you can tow in 2-wheel drive if required. But before towing in 2-wheel drive, you must check that the transmission changes automatically to 4-wheel drive when the brake pedal is pressed (i.e. that the **2-wheel drive selected indicator light** goes out).

5 To lower the hitch, first raise the hitch by operating switch either **H** or **K/L**. Pull up and hold release handle **A** to release locking lever **B**, and lower the hitch by operating switch either **H** or **K/L**. The locking lever **B** will automatically spring back to the engaged position when the hitch is raised.

Operate trailer switch **H** or **K/L** to lower and raise the hitch.





HYDRAULIC TOW HITCH OPTION

6 Hitch/Auxiliary selector switch **J** is fitted on later machines. If fitted, operate to select the hitch circuit, the switch lamp should be extinguished.

Note: *make sure the Hitch/Auxiliary switch lamp is working, ie. select* ***ON****.*

7 Operate **K/L** to lower and raise the hitch.

8 In certain conditions you may have to drive forward when raising the hitch to prevent the pickup hitch overriding the trailer towing hitch.

9 Connect the trailer lights into socket **C**. Make sure that all the trailer lights are working correctly and are visible by other road users.

Make sure the trailer direction indicator lights are working correctly.

10 If an optional trailer brake valve is fitted, connect the trailer brakes into socket **D**. Trailer braking is operated by the brake pedals.

Before travelling on the public highway check that the brakes work correctly and get used to the braking effect.

11 To operate trailer auxiliary services disconnect hydraulic hitch hose **E** from socket **F** and reconnect to stowage socket **G**. Connect trailer auxiliary hose to socket **F**. Operate trailer switch **H** or **K/L** depending on the attachment fitted and the function required.

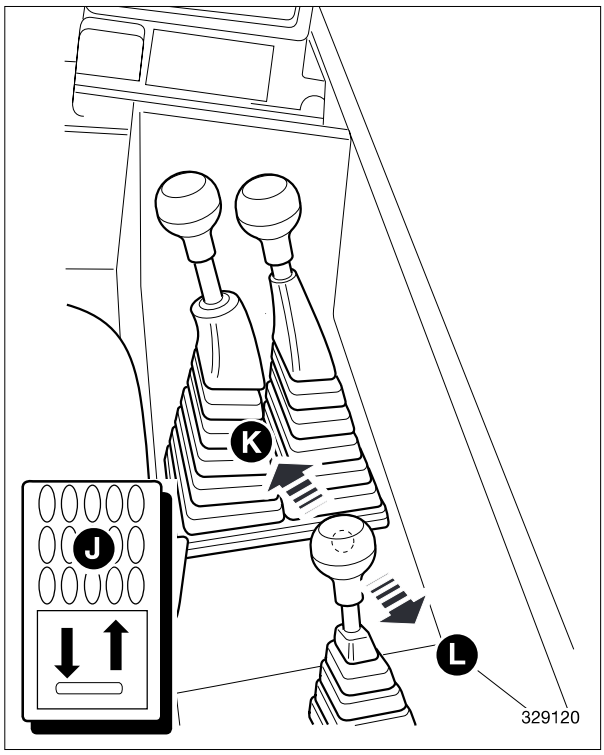
Before the hitch can be operated again connect the hoses in their original positions.

To prevent contamination of the machine hydraulics, when using a tipping trailer leave the trailer flat before disconnecting the hydraulic service to exhaust the trailer ram of oil.

⚠ WARNING

Make sure the trailer hitch has correctly engaged and locked before driving off.
5-5-4-10

12 Select 2-wheel steer if towing on Public Roads. Make sure the indicator shows that 2-wheel steer has engaged. *See* ***Preparing For Road Travel*** *in OPERATION section.*



TRANSPORTING THE MACHINE

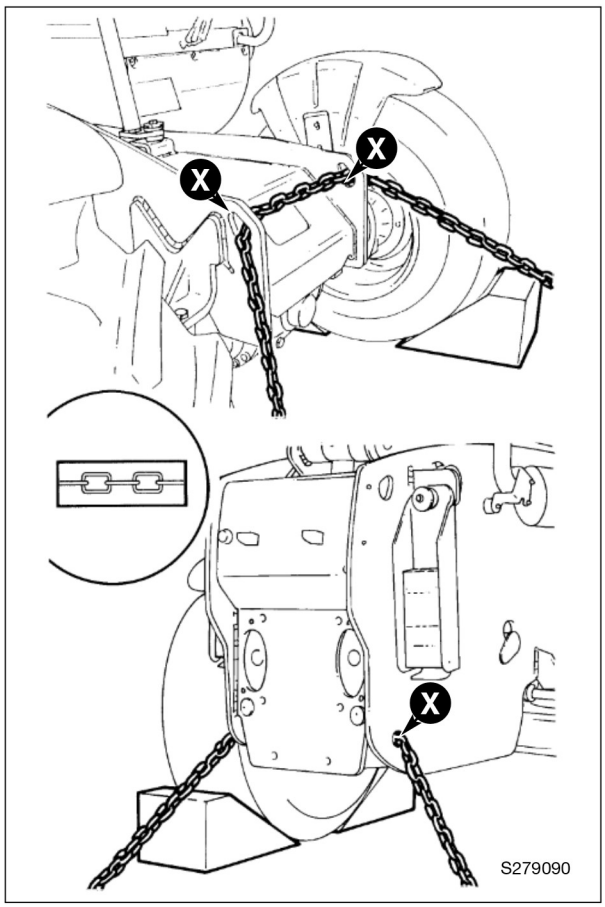
The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.
5-2-5-9

***Note**: Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.*

Make sure that the transporting vehicle is suitable. See SPECIFICATION section for the dimensions and weight of your machine.

⚠ WARNING

Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tyres. Make sure the machine will not foul on the ramp angle. *See SPECIFICATION* ***section*** **for the minimum ground clearance for your machine.**
2-2-7-5



1 Place chocks at the front and rear of the trailer wheels.

***Note**: Before moving the machine on the trailer, make sure that the machine will not foul on the ramp/trailer angle. See SPECIFICATION section for your machine's ground clearance.*

2 Make sure the ramps are correctly in place and secure.

3 Set the boom as in ***Preparing For Road Travel*** *in OPERATION section.*

4 Carefully drive the machine onto the trailer.

5 When the machine is safely in position, engage the parking brake and set the drive to neutral.

6 Lower the carriage onto the trailer.

7 Secure the stabilisers in the raised position.

8 Switch off the engine and remove the starter key. Secure the cab. Cover the exhaust stack.

9 Check that the overall height of the load is within regulations. Adjust if necessary.

10 Put chocks at the front and rear of all four tyres. Anchor the machine to the trailer with chains. The anchor points **X** are shown on the illustration.

11 Measure the maximum height of the machine from the ground. Try to make sure the truck driver knows the clearance height before he drives away.

LIFTING A MACHINE

Carry out the following procedure when lifting a machine:

Retract the boom and lower to the ground.

Remove all attachments.

Switch OFF the engine, remove the key, shut window(s), vacate the machine and shut the door.

Remove all loose equipment from machine exterior.

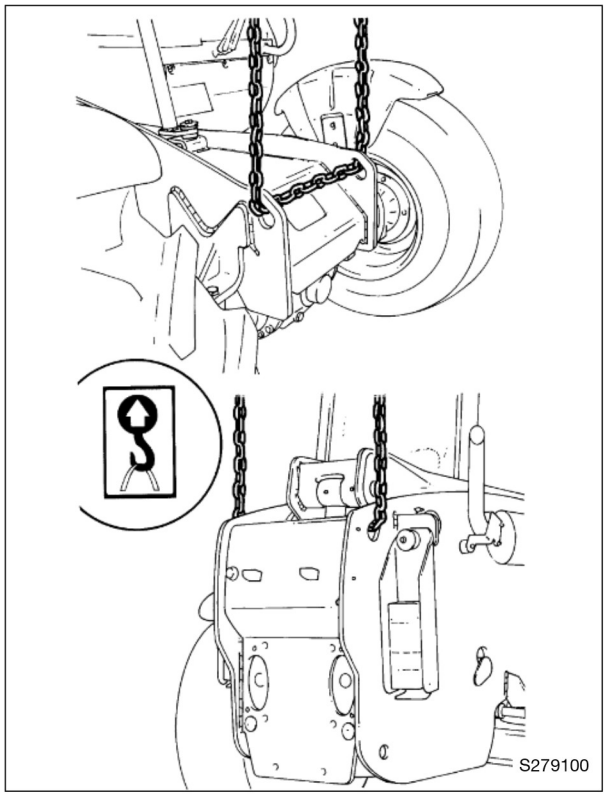
Check the unladen weight of the machine, *see* ***Static Dimensions*** *(SPECIFICATIONS section).*

⚠ WARNING

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.
INT-1-3-7

Attach lifting equipment to lifting points as shown.

Take the weight of the machine. If the lifting equipment is fouling on the machine use spreader bars to prevent damage.



Check that the lifting eye is positioned directly above the machine centre of gravity, *see* ***Static Dimensions*** *(SPECIFICATIONS section).*

⚠ DANGER

Do not stand underneath a raised load. Stand clear and to one side until the load has been safely lowered. Make sure that the area is clear of other people before lowering the load. If you do not follow these precautions you or others could be killed or seriously injured.
2-3-5-3

⚠ WARNING

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. Work sites can be noisy, do not rely on spoken commands.
INT-2-2-3