Dear JCB Customer

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

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

Please contact your local JCB dealer if the Installation Form has not yet been completed with you.

Your Local JCB Dealer is:

OPERATOR MANUAL

THIS MANUAL SHOULD ALWAYS STAY WITH THE MACHINE

RTFL - 926, 930, 940, 950

ENGLISH - 9811/5700 - ISSUE 7 - OCTOBER 2013

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Safety Notices

Important Information

T1-042

The Operator Manual

⚠ WARNING

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

INT-1-4-2

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

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

Safety Warnings



This safety alert system identifies important safety messages in this manual. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

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

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly 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

Page left intentionally blank

Introduction

About This Manual

Machine Model and Serial Number

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

- 926 from Machine Serial No. 1281371
- 930 from Machine Serial No. 1281371
- 940 from Machine Serial No. 1281371
- 950 from Machine Serial No. 1483230

Using this Manual

T1-044

This manual 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 manual 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.

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.

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.

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

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

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.

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

Left Side, Right Side

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

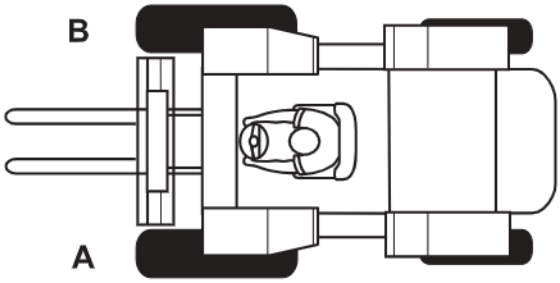


Fig 1.

Cab/Canopy

T1-003_2

This manual frequently makes references to the cab. For instance, 'do not operate the machine without a manual in the cab'. It should be noted that these statements also apply to canopy build machines.

Cross References

T1-004_2

In this publication, page cross references are made by presenting the subject title printed in bold, italic and underlined. It is preceeded by the 'go to' symbol. The number of the page upon which the subject begins, is indicated within the brackets. For example: ⇨ ***Cross References (1)***.

Machine Description

The JCB Rough Terrain Fork Lift

This is a self-propelled, seated-operator, rough terrain counterbalance truck for operation on unimproved natural terrain and disturbed terrain. The machine has an integral front-mounted mast and carriage. The carriage is normally fitted with a pair of forks or other load carrying attachment which can pick up a load through forward motion and raise or lower it to a suitable height for transport and discharge in another place.

Note: *The illustration(s) show a typical machine model; your machine may look different from the model shown.*

Intended Use

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

Component Locations

- Items **1** to **7**: ⇨ *Fig 2. (🗋 3)*.
- Items **8** to **22**: ⇨ *Fig 3. (🗋 4)*.

1 Mast
2 Carriage
3 FOPS Cab
4 Engine Cover
5 Hydraulic Tank
6 Fuel Tank
7 Quick Release Couplings (if fitted)
8 Expansion Bottle
9 Battery
10 Link Box Fuses
11 Exhaust
12 Engine
13 Water Separator
14 Transmission Oil Dipstick
15 Fuel Filter
16 Engine Oil Dipstick
17 Air Filter
18 Brake Fluid Reservoir
19 Radiator
20 Engine Oil Filler Cap
21 Front End Accessory Drive Belt
22 Radiator Cap
23 Air Filter Element Indicator

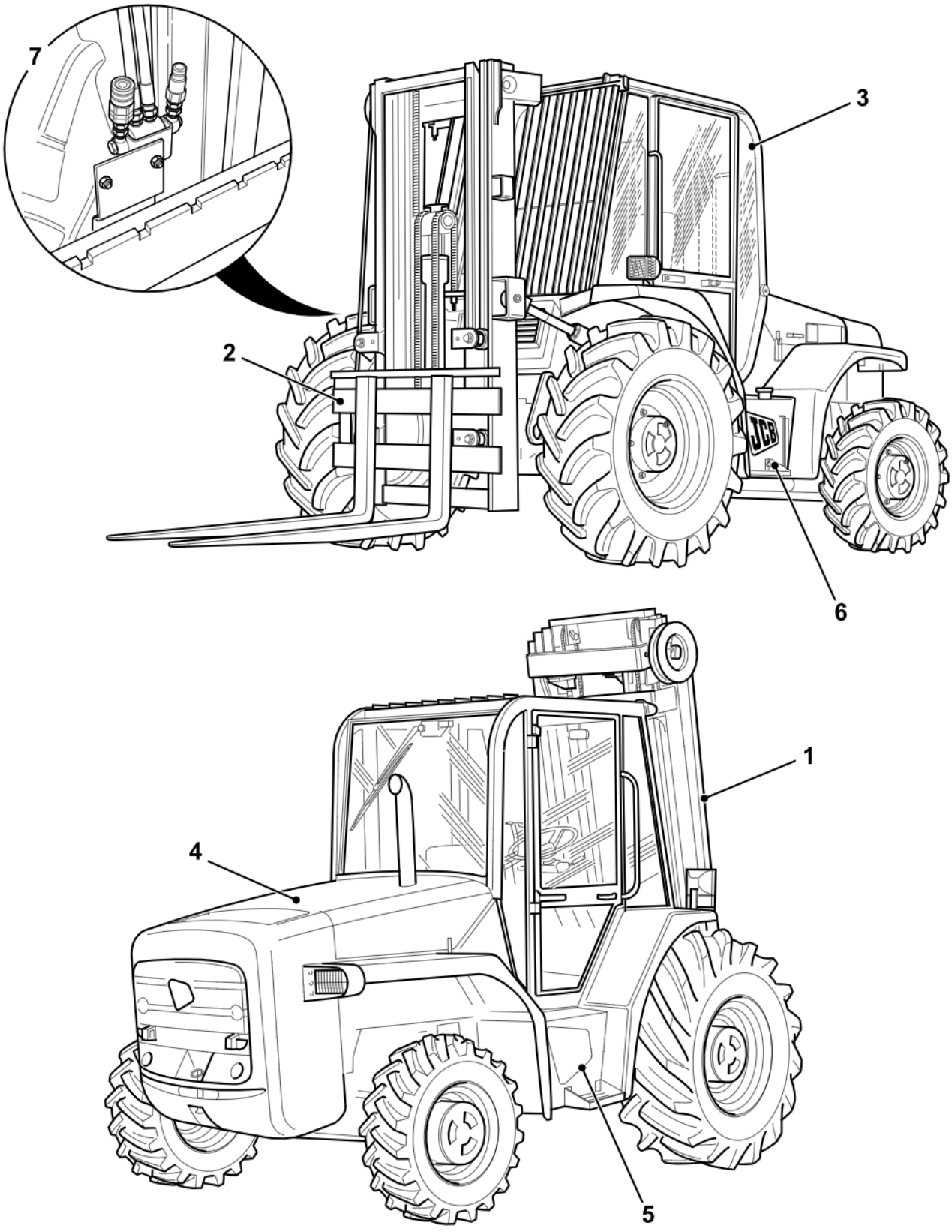


Fig 2.

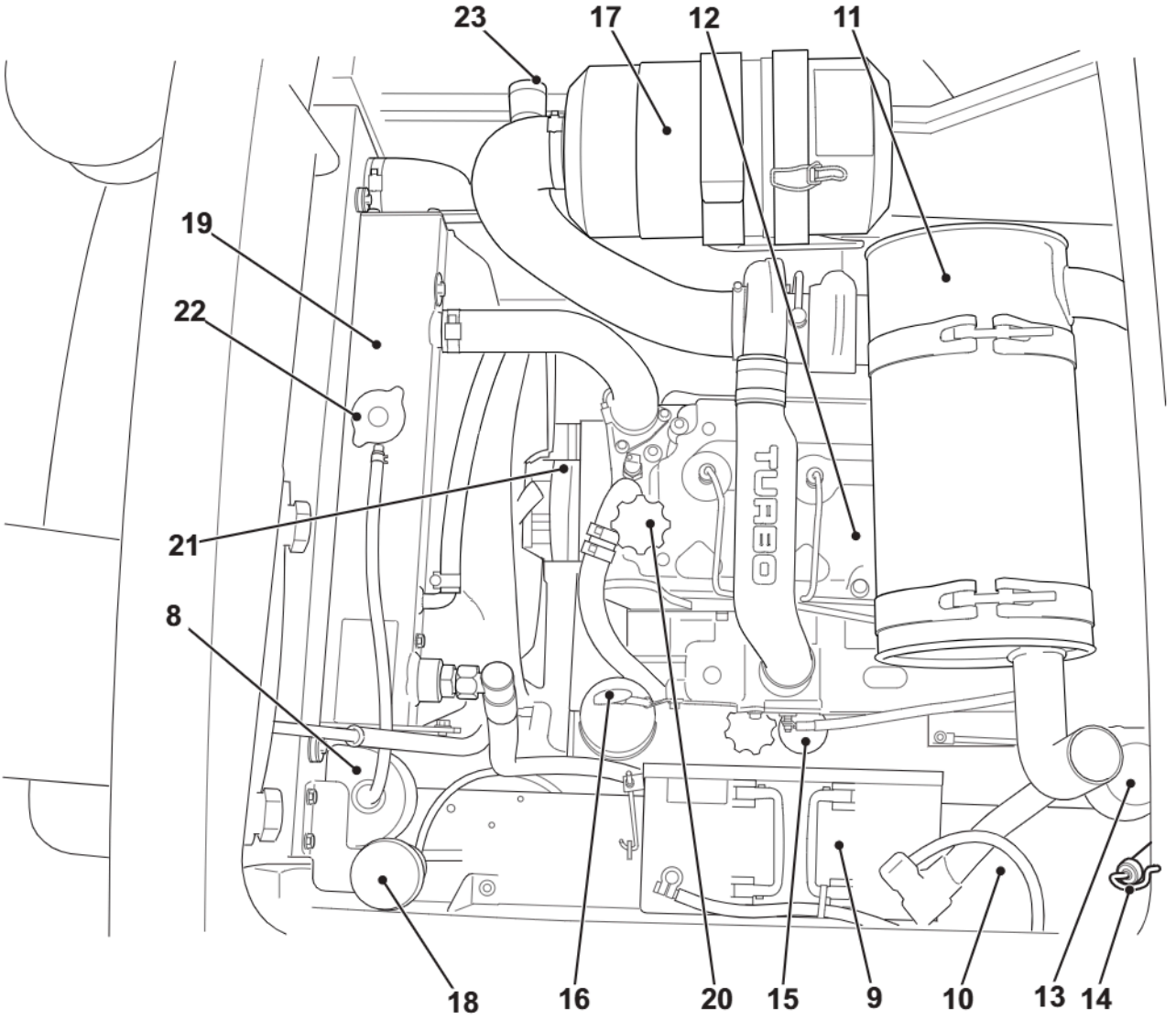


Fig 3. Engine Compartment

Safety Check List

P9-1003_3

Safety - Yours and Others

INT-1-3-1_3

All machinery can be hazardous. When a 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 manual 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

General Safety

T1-043

⚠ WARNING

To operate the machine safely you must know the machine and have the skill to use it. You must abide by all relevant laws, health and safety regulations that apply to the country you are operating in. The Operator Manual instructs you on the machine, its controls and its safe operation; it is not a training manual. If you are a new operator, get yourself trained in the skills of using a machine before trying to work with it. If you don't, you will not do your job well, and you will be a danger to yourself and others.

INT-1-4-1

⚠ WARNING

Care and Alertness

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

INT-1-3-5

⚠ WARNING

Clothing

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

INT-1-3-6_2

⚠ WARNING

Alcohol and Drugs

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

INT-1-3-9_2

⚠ WARNING

Feeling Unwell

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

8-1-2-4

⚠ WARNING

Mobile Phones

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

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

INT-3-3-9

⚠ WARNING

Lifting Equipment

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

INT-1-3-7_2

⚠ WARNING

Raised Equipment

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

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

13-2-3-7_3

⚠ 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

⚠ DANGER

Lightning

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

5-1-1-2

⚠ WARNING

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.

INT-1-3-10_2

Operating Safety

⚠ 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 manual are completed before using the machine.

INT-2-1-2_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

⚠ 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

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 and get into fresh air.

INT-2-1-10_2

⚠ WARNING

Work Sites

Work sites can be hazardous. Inspect the site before working on it. You could be killed or injured if the ground gives way under your machine or if piled material collapses onto it. Check for potholes and hidden debris, logs, ironwork etc. Any of these could cause you to lose control of your machine. Check for utilities such as electric cables (overhead and underground), gas and water pipes etc. Mark the positions of the underground cables and pipes. Make sure that you have enough clearance beneath overhead cables and structures.

INT-2-2-1_2

⚠ 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

Parking

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

INT-2-2-4_2

⚠ WARNING

Banks and Trenches

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

INT-2-2-5

⚠ WARNING

Safety Barriers

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

INT-2-2-8

⚠ 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

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, i.e. combustible vapours, gas or dust, without first consulting your JCB Distributor.

INT-2-1-14

⚠ CAUTION

Regulations

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

INT-1-3-3

⚠ WARNING

Practise

You or others can be killed or seriously injured if you do unfamiliar operations without first practising them. Practise away from the work site on 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

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

5-3-1-12_3

⚠ WARNING

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

2-2-3-6

⚠ WARNING

Electrical Power Cables

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

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

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

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

2-2-5-4

⚠ CAUTION

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

5-5-1-1_2

⚠ WARNING

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

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

2-4-5-2_1

⚠ DANGER

Working Platform

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

5-1-5-9

⚠ WARNING

Machine Safety

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

8-1-2-3

⚠ WARNING

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

10-1-1-40

⚠ WARNING

Travelling at High Speeds

Travelling at high speeds can cause accidents. Do not reverse in a high gear with full throttle. Always travel at a safe speed to suit working conditions.

INT-5-3-3

⚠ WARNING

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

5-2-6-5

⚠ WARNING

You could be killed or seriously injured if you operate a machine with a damaged or missing ROPS/FOPS. If the Roll Over Protection Structure (ROPS)/Falling Objects Protection Structure (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_6

⚠ CAUTION

Fork Spacing

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

One-Fork Lifting

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

5-1-4-3

⚠ CAUTION

Unloading

Never unload the forks by stopping the machine suddenly. Follow the procedures in the Operator Manual for unloading.

5-1-4-4_2

⚠ CAUTION

Uneven Ground

Loads stacked on uneven ground can topple. Never stack loads on uneven ground.

5-1-4-5

⚠ WARNING

Scaffolding

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

5-1-4-6

⚠ CAUTION

Overhead Clearance

A raised mast can strike overhead objects. Always check for overhead clearance before raising the mast.

9-1-3-1

⚠ WARNING

Mast/Travelling

Operating the mast and carriage while travelling can cause accidents. You will not have total control. Never operate the mast and carriage while travelling.

9-1-3-2

⚠ 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

⚠ WARNING

Forks/Turning

The forks project in front of the machine. Make sure there is enough clearance for the forks when making turns.

5-1-5-4_2

⚠ WARNING

High Loads

A high load can block your view and reduce the machine's stability. Travel with the load low to the ground. Travel slowly and with caution over rough, muddy or loose surfaces.

5-1-3-2

⚠ WARNING

Slopes

Always drive a LOADED machine FORWARD UPHILL and in REVERSE DOWNHILL.

Always drive an UNLOADED machine in REVERSE UPHILL and FORWARD DOWNHILL.

9-1-3-3

⚠ WARNING

Hillsides

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

⚠ WARNING

Visibility

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

Do not operate the machine if you cannot see clearly.

5-1-4-7

⚠ WARNING

Keep Your Hands and Feet Inside the Vehicle

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

13-1-1-17

⚠ WARNING

Controls

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

0179_2

⚠ CAUTION

Passengers

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

INT-2-2-2_1

⚠ WARNING

Fires

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

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

INT-3-2-7_2

⚠ 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 and jump from the cab. Stay in the cab, with your seat belt fastened.

INT-2-1-12

MaIntenance Safety

⚠ 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 the 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

Repairs

If your machine does not function correctly in any way, get it repaired straight away. Neglect of necessary repairs could result in an accident or affect your health. Do not try to do repairs or any other type of maintenance work you do not understand. To avoid injury and/or damage get the work done by a specialist engineer.

GEN-1-5_2

⚠ WARNING

Metal Splinters

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

INT-3-1-3_2

⚠ WARNING

Electrical Circuits

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

INT-3-1-4

⚠ WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

⚠ WARNING

Fuel

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

INT-3-2-2_3

⚠ 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

⚠ CAUTION

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

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

INT-3-2-14

⚠ WARNING

Soft Ground

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

INT-3-2-4

⚠ WARNING

Always wear safety glasses when dismantling assemblies containing components under pressure from springs. This will protect against eye injury from components accidentally flying out.

GEN-6-2

⚠ CAUTION

Rams

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

⚠ CAUTION

Cleaning

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

INT-3-2-11

⚠ WARNING

When using cleaning agents, solvents or other chemicals, you must adhere to the manufacturer's instructions and safety precautions.

GEN-1-9

⚠ 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

⚠ WARNING

Hydraulic Hoses

Damaged hoses can cause fatal accidents. Inspect the hoses regularly. Do not use the machine if a hose or hose fitting is damaged.

INT-3-3-2_4

⚠ CAUTION

Waxoyl contains turpentine substitute which is flammable. Keep flames away when applying Waxoyl. Waxoyl can take a few weeks to dry completely. Keep flames away during the drying period.

Do not weld near the affected area during the drying period. Take the same precautions as for oil to keep Waxoyl off your skin. Do not breathe the fumes. Apply in a well-ventilated area.

5-3-1-9

⚠ WARNING

Working Under the Machine

Make the machine safe before getting beneath it. Ensure that any fitments on the machine are secure; engage the park brake, remove the starter key, disconnect the battery.

INT-3-3-8_2

⚠ WARNING

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 (572°F) 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 (572°F) (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 **Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.**

2 **Thoroughly wash contaminated area with detergent and water.**

3 **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.

INT-3-3-5_4

⚠ WARNING

Protect your eyes when grinding metal. Wear safety glasses or goggles. Remove or protect any combustible materials from the area which could be ignited by sparks.

GEN-1-12

⚠ WARNING

To avoid burning wear personal protective equipment (PPE) when handling hot components. To protect your eyes, wear personal protective equipment (PPE) when using a brush to clean components.

HYD-1-3_3

⚠ WARNING

Arc Welding

To prevent the possibility of damage to electronic components, disconnect the battery and the alternator before arc-welding on the machine or attached implements.

If the machine is equipped with sensitive electrical equipment, i.e. amplifier drivers, electronic control units (E.C.U.s), monitor displays, etc., then disconnect them before welding. Failure to disconnect the sensitive electrical equipment could result in irreparable damage to these components.

Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Do not connect the welder cable or apply any weld to any part of the engine.

Always connect the welder earth (ground) cable to the same component that is being welded, i.e. boom or dipper, to avoid damage to pivot pins, bearings and bushes. Attach the welder earth (ground) cable no more than 0.6 metres (2 feet) from the part being welded.

INT-3-1-15_2

⚠ WARNING

Counterweights

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

INT-3-2-5

⚠ WARNING

Compressed air is dangerous. Wear suitable eye protection and gloves. Never point a compressed air jet at yourself or others.

0147_1

⚠ WARNING

Accumulators

The accumulators contain hydraulic fluid and gas at high pressure. Prior to any work being carried out on systems incorporating accumulators, the system pressure must be exhausted by a JCB distributor, as the sudden release of the hydraulic fluid or gas may cause injury.

INT-3-1-17

⚠ 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

⚠ CAUTION

Do not disconnect the battery while the engine is running, otherwise the electrical circuits may be damaged.

INT-3-1-14

⚠ WARNING

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

0125

⚠ WARNING

Battery Gases

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

INT-3-1-8_2

⚠ DANGER

Electrolyte

Battery electrolyte is toxic and corrosive. Do not breathe the gases given off by the battery. Keep the electrolyte away from your clothes, skin, mouth and eyes. Wear personal protective equipment (PPE).

INT-3-2-1_4

⚠ WARNING

Battery Terminals

The machine is negatively earthed. Always connect the negative pole of the battery to earth.

When connecting the battery, connect the earth (-) lead last.

When disconnecting the battery, disconnect the earth (-) lead first.

INT-3-1-9

⚠ WARNING

An exploding tyre can kill. Inflated tyres can explode if over-heated or over-inflated. Follow the instructions given when inflating the tyres. Do not cut or weld the rims. Use a tyre/wheel specialist for all repair work.

2-3-2-7_2

⚠ WARNING

Jacking

A machine can roll off jacks and crush you unless the wheels have been blocked. Always block 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

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

⚠ WARNING

Wheels and tyres are heavy. Take care when lifting or moving them.

Store with care to ensure that they cannot fall and cause injury.

13-3-1-7_1

⚠ 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

Safety Labels

Introduction

T1-014_2

⚠ WARNING

Safety Labels

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

INT-1-3-11

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

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

Note: *The illustration(s) show a typical machine model. Your machine may look different from the model shown.*

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

Safety Label Identification

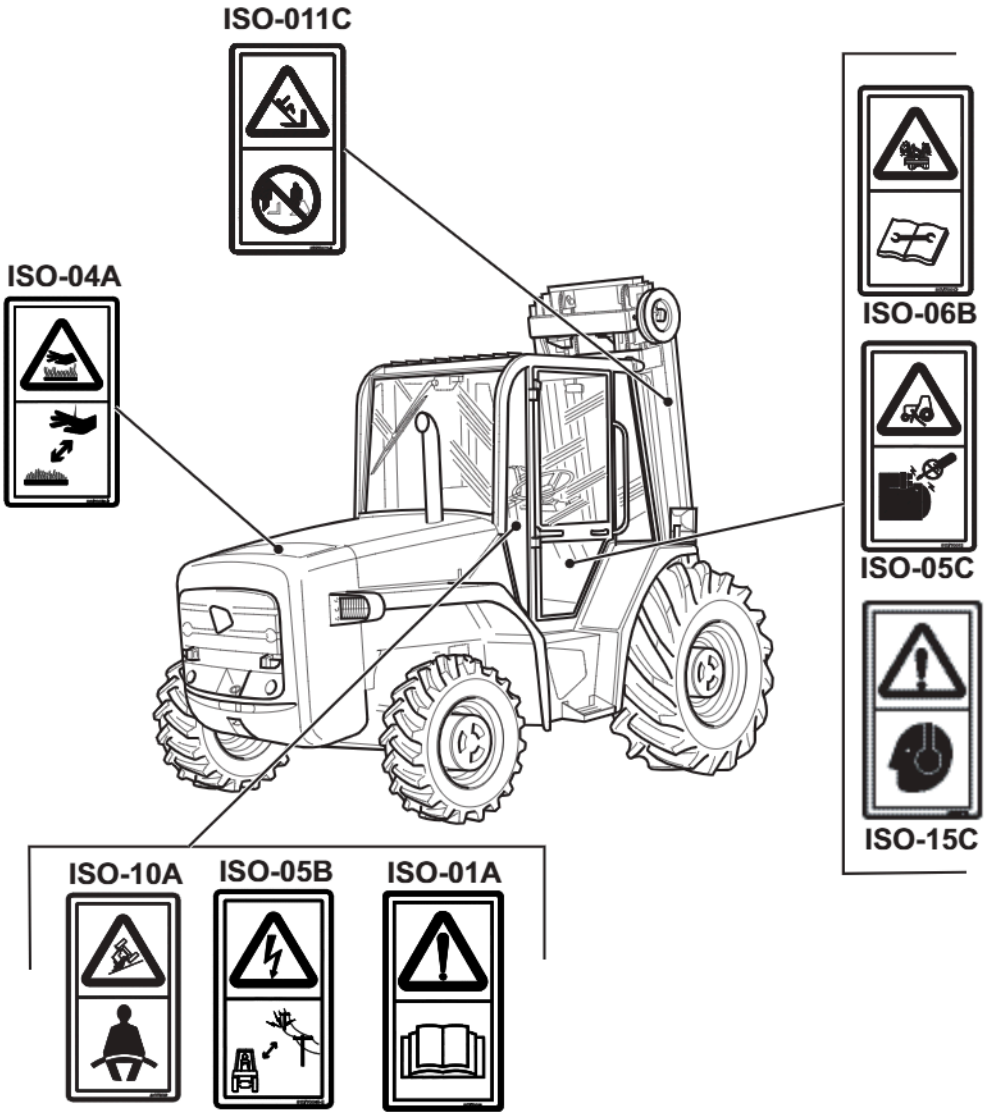


Fig 4. Safety Label Locations

Part Numbers and Descriptions

ISO-01A

Part Number: 817/70014

Description: Warning. Read the operator manual before you operate the machine.


817-70014-3

ISO-04A

Part Number: 817/70094

Description: Burns to fingers and hands. Stay a safe distance away.


817-70094-2

ISO-05C

Part Number: 817/70012

Description: Runover. Start the engine from the operator seat only. Do not short across the terminals.


817-70012-2

ISO-06B

Part Number: 332-F5860

Description: Pressure hazard. Refer to ***Cooling System (Routine Maintenance Section)***.


332-F5860-1

ISO-011C

Part Number: 817/70011

Description: Fall from raised attachment. Do not stand/ride on the bucket or forks.


817-70011-2

ISO-15C

Part Number: 332/P4712

Description: Noise warning. Wear applicable ear protection.


332-P4712-1

ISO-010A

Part Number: 817/70029

Description: Crush hazard. Wear the seat belt when you operate the machine.


817-70029-3

ISO-05B

Part Number: 817/70040

Description: Electrical hazard. Keep a safe distance away from power lines.


817-70040-2

Identifying Your Machine

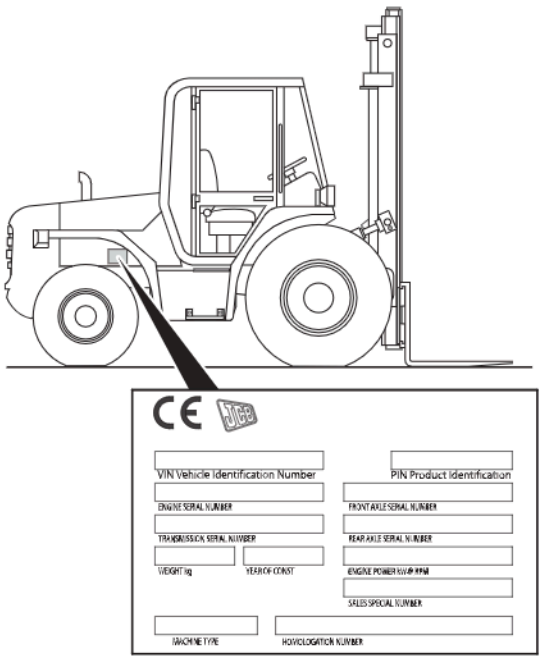
Machine Identification Plate

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

Note: *The machine model and build specification is indicated by the PIN. Refer to* ***Typical Product Identification Number (PIN)****.*

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.



823500-2

Fig 5.

Typical Product Identification Number (PIN) - Early Machines

JCB	930	36	C	01234567
1	2	3	4	5

1 World Manufacturer Identification (3 Digits)

2 Machine Model (3 Digits)

926, 930, 940 or 950

3 Mast Type (2 Digits)

36 = 3.6 metre mast
45 = 4.5 metre mast
55 = 5.5 metre mast
65 = 6.5 metre mast
NM = No Mast fitted

4 Check letter (1 Digit)

The Check Letter is used to verify the authenticity of the machine's PIN.

5 Machine Serial Number (8 Digits)

Each machine has a unique serial number.

Typical Product Identification Number (PIN) - Later Machines

JCB	930	02	C	01234567
1	2	3	4	5

1 World Manufacturer Identification (3 Digits)

2 Machine Model (3 Digits)

926, 930, 940 or 950

3 Wheel Drive Option (2 Digits)

02 = 2 Wheel Drive
04 = 4 Wheel Drive

4 Check letter (1 Digit)

The Check Letter is used to verify the authenticity of the machine's PIN.

5 Machine Serial Number (8 Digits)

Each machine has a unique serial number.

Component Identification Plates

Typical Engine Identification Number

T1-005_3

Engine data labels **A** are located on the cylinder block at position **C** and rocker cover **D** (if fitted). ⇨ *Fig 6. (🗋 21)*. The data label contains important engine information and includes the engine identification number **E**.

A typical engine identification number is explained as follows:

SA	320/40001	U	00001	04
1	2	3	4	5

1 Engine Type

S = 4.4 litre series.

JCB Dieselmax (Tier 2)

A = Naturally aspirated

B = Turbocharged

C = Turbocharged and intercooled

JCB Dieselmax (Tier 3)

D = Turbocharged

E = Electronic common rail fuel injection

F = Turbocharged and after-cooled

2 Engine part number

3 Country of manufacture

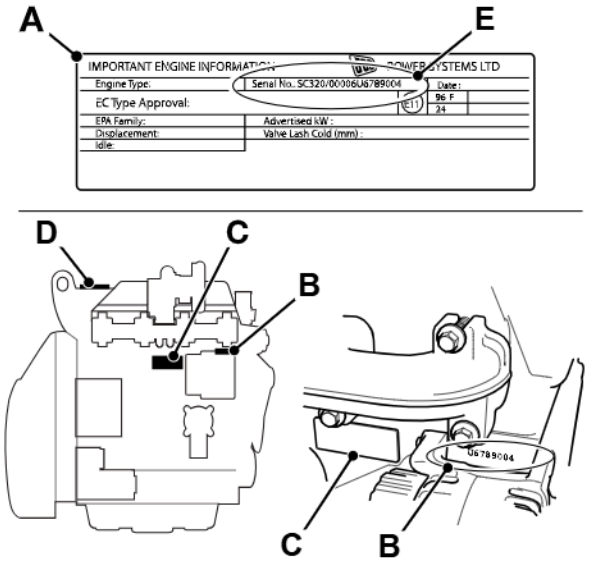
U = United Kingdom

4 Engine Serial Number

5 Year of Manufacture

The last three parts of the engine identification number are stamped on the cylinder block at position **B**.

U 00001 04



C007820-C2

Fig 6. Engine

Transmission Identification Numbers

Axles

The front axle serial number is stamped on a data plate mounted to the front of the left hand axle arm. ⇨ *Fig 7. (🗋 22)*.

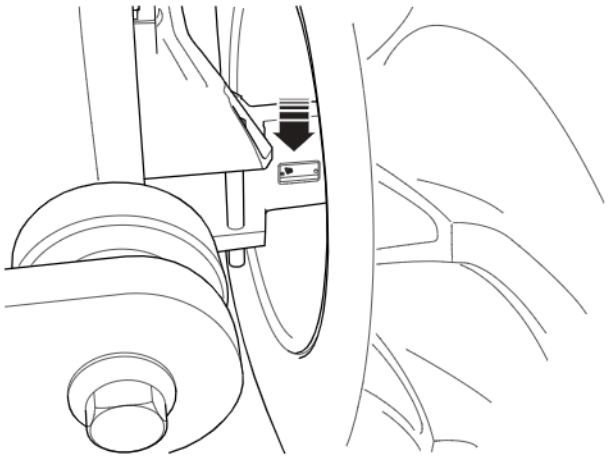


Fig 7. Front Axle

The rear axle serial number is also stamped on a plate mounted to the left hand front face of the axle. ⇨ *Fig 8. (🗋 22)*.

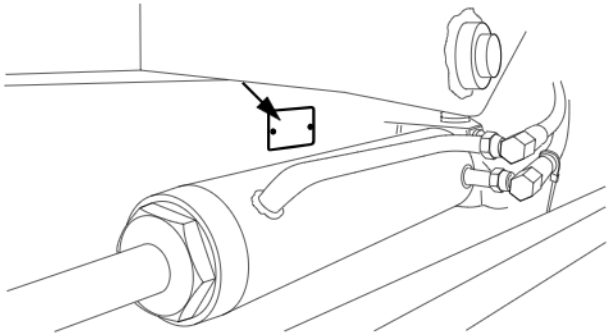


Fig 8. Rear Axle

Gearbox

The gearbox has a serial number stamped on a data plate **Y** as shown. ⇨ *Fig 9. (🗋 22)*.

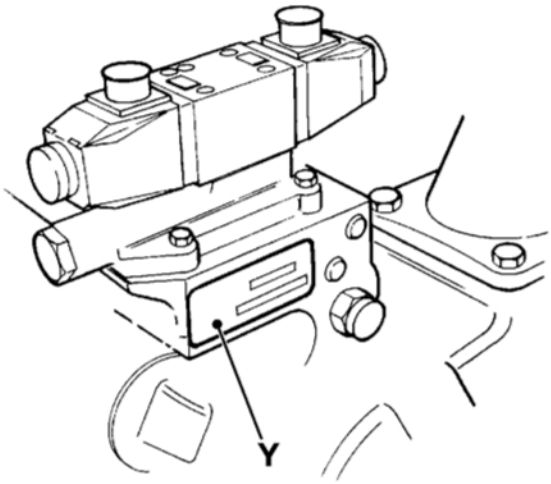
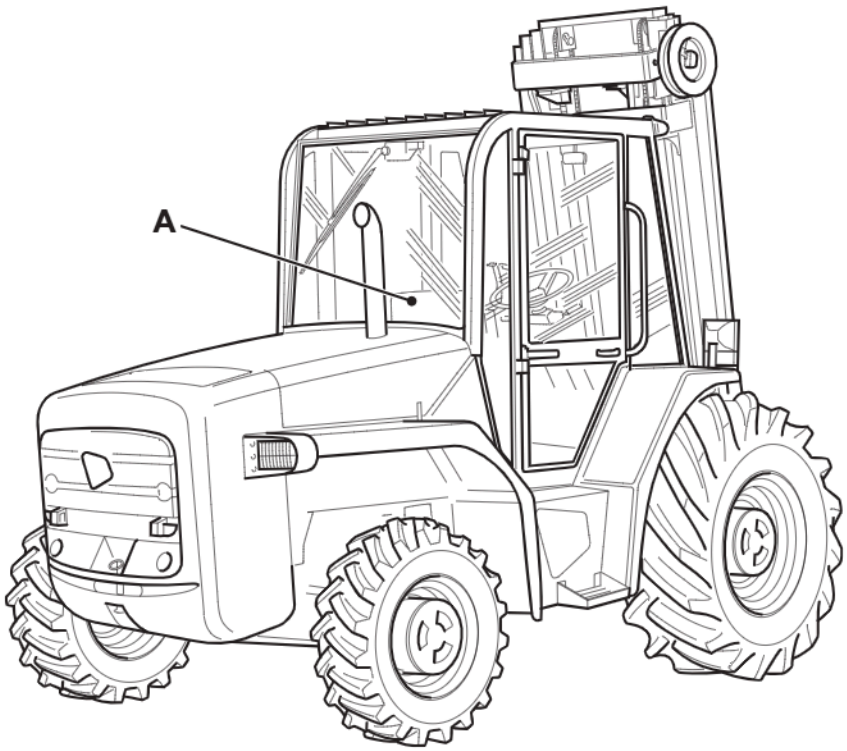


Fig 9. Transmission

ROPS/FOPS Certification Plate



823860-2

Fig 10.

Machines built to ROPS/FOPS standards have an identification label **A** fitted to the inside of the cab. ⇨ *Fig 10. (🗋 23)*.

The FOPS structure provides Impact Protection against falling objects (as defined in ISO 6005:2004).

	Definition of terms:
ROPS	Roll Over Protection Structure
FOPS	Falling Objects Protection Structure

FOPS Data Plate

⚠ WARNING

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

8-2-8-17

If the machine is used in any application where there is a risk of falling objects then a falling-objects protective structure (FOPS) must be installed. For further information contact your JCB Dealer

The falling objects protection structure (FOPS) is fitted with a dataplate. The dataplate indicates what level protection the structure provides.

Note: *A load backrest extension can be fitted to minimise the possibility of the load failing towards the mast when the mast is in a position of maximum reward tilt. A screen guard can also be fitted to provide protection from objects coming from the front, contact your JCB distributor.*

Machine Security

Introduction

T1-019

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

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

JCB Plantguard

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.

Construction Equipment Security And Registration Scheme (CESAR)

T1-020

JCB are pleased to announce, the availability of CESAR a simple, effective method of machine identification and registration that operates throughout the United Kingdom and Ireland and across the whole spectrum of JCB products.

CESAR is a scheme to help reduce plant theft, and was developed by the Metropolitan Police and the Home Office Plant Theft Action Group.

The key to the scheme is its simplicity and will mean that every police officer in the country will know how to identify construction machinery and verify ownership. This will provide a major leap forward in both protecting machinery, and recovering it.

The Construction Equipment Association is managing the scheme, and Datatag are providing the security material and support. JCB is fully supportive of the CESAR initiative and will offer it as a factory fit option across the range.

The CESAR kit includes 2 Tamper proof triangular ID plates fitted on either side of the machine, a unique transponder, mini radio frequency identification tags (RFIDs) concealed throughout the machine, Datatag micro dots, and a unique DNA coded chemical painted on the machines major components. Plus a registration certificate logged onto the CESAR or DVLA databases, and a change of keeper form.

Operation

Introduction

T2-006_2

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

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

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

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

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

Remember

BE CAREFUL
BE ALERT
BE SAFE

Before Entering the Cab

T2-025_4

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

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

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

2-2-1-1

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(s) and handholds are clean and dry.
- **d** Clean all safety and instructional labels. Replace any that are missing or cannot be read.

2 Check for damage.

- **a** Inspect the machine generally for damaged and missing parts.
- **b** Make sure that the attachment is secure and in good condition.
- **c** Make sure that all pivot pins are secured correctly in place.
- **d** Inspect the windows for cracks and damage. Glass splinters can blind.
- **e** Check for oil, fuel and coolant leakages underneath the machine.

⚠ WARNING

You could be killed or injured if a machine tyre bursts. Do not use the machine with damaged, incorrectly inflated or excessively worn tyres.

2-2-1-2

3 Make sure the tyres are correctly inflated.

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

4 Make sure that all of the filler caps are installed correctly.

5 Make sure that all of the access panels are closed and secure.

Note: *If the filler caps and access panels are fitted with locks, we recommend that you lock them to prevent theft or tampering.*

Entering and Leaving the Cab

⚠ WARNING

Entering/Leaving

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

Make sure the machine is stopped and correctly parked before entering or leaving the cab. If necessary, refer to ***Stopping and Parking the Machine***.

When you get on and off the machine always maintain a three point contact with the handrails and step. Do not use the machine controls or steering wheel as handholds.

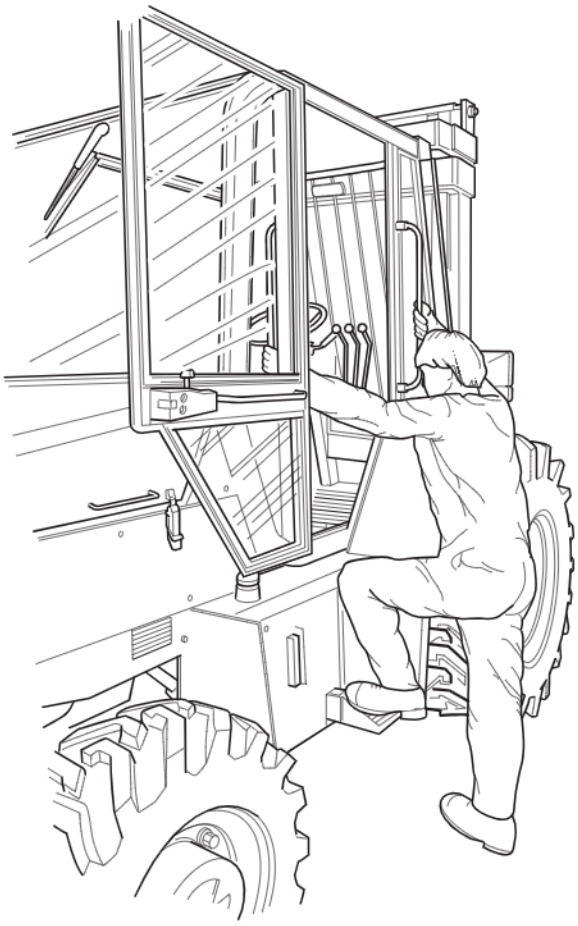


Fig 11.

Doors and Windows

Opening and Closing the Doors

To open a door from the outside, unlock it with the key provided and press the lock barrel.

Close the door from the inside by pulling it firmly; it will latch itself. To open a door from inside, pull lever **A** to the rear. ⇨ *Fig 12. (28)*.

Each door can be secured fully open. Swing it all the way round and push the knob **B** into the rubber socket **C** on the side of the cab. ⇨ *Fig 13. (28)*. Press plate **D** to release the door.

Note: *Do not drive the machine with the doors unlatched. Otherwise they could swing open.*

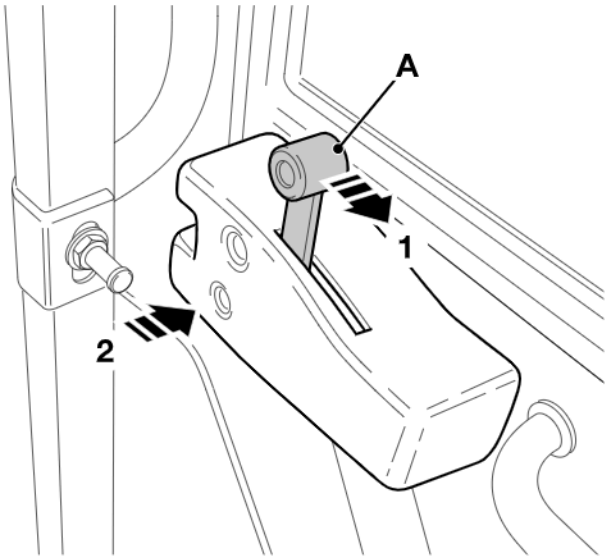


Fig 12.

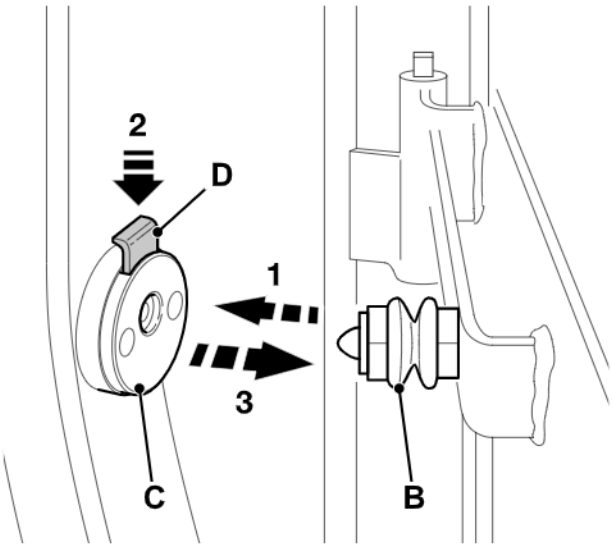


Fig 13.

Seat Controls

Introduction

T2-007_3

⚠ WARNING

Seat

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

13-1-1-9_1

The operator's 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 pedals fully with your back against the seat back.

Basic Seat

P5-2026

1 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.

2 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**.

3 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 three settings.)

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

4 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 **4A**.

If the indicator is behind the frame as shown in **4B**, turn the handle **5** so that **+** is uppermost. If the indicator is in front of the frame as in **4C**, turn handle **5** so that **-** is uppermost. Stay in the seat. Pump handle **5** until the indicator is level as in **4A**.

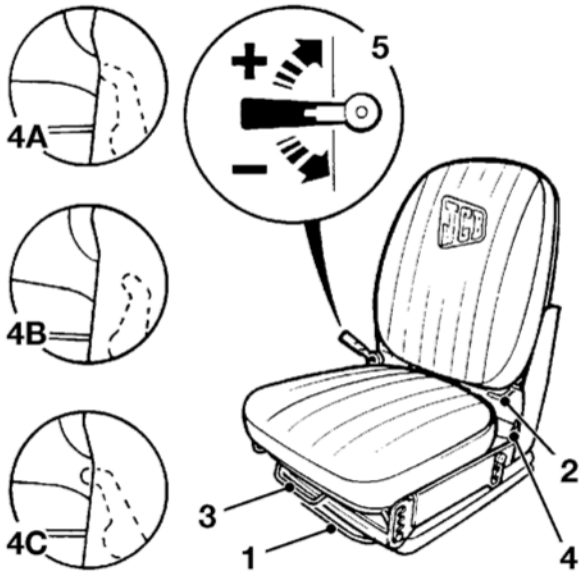


Fig 14.

Basic Seat (Type 2)

To adjust the seat, move lever **A** in the direction shown and slide the seat forward or back. Release the lever and make sure the seat latches.

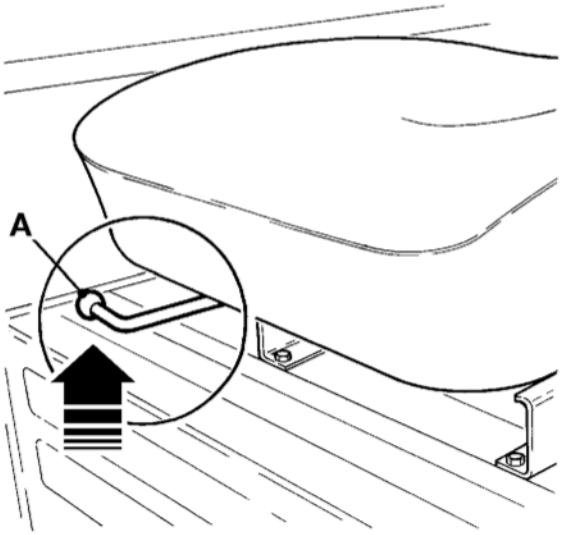


Fig 15.

Suspension Seat (Option)

Fore/Aft - Move lever **1** horizontally 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. Pull knob **2** forward to disengage and slide it fully horizontal in the (+) direction.

Operate ratchet handle **3** to adjust the seat up or down to the desired height.

A light driver will require the pointer **4** to be close to the 'small person' symbol. To adjust the pointer in this direction operate the ratchet handle **3** with its - sign adjacent to the metal lug.

For a heavier driver, reverse the ratchet handle**3** 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 **2** in the (-) direction to restrict the upwards motion.

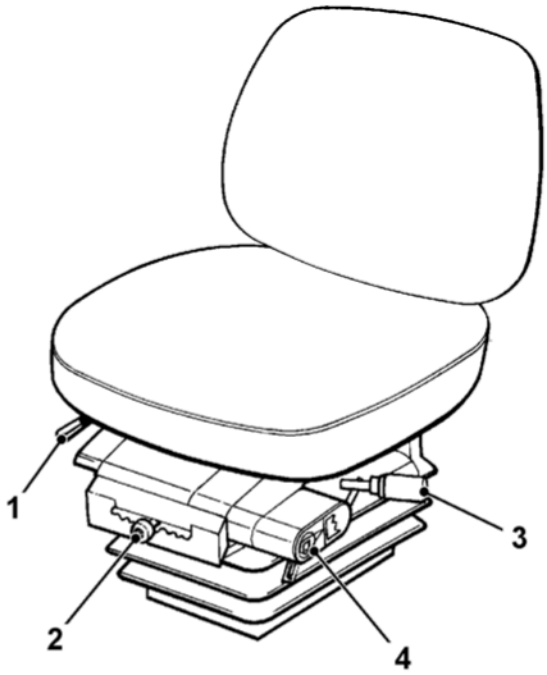


Fig 16.

Seat Belt

Inertia Reel Seat Belt

T2-001_2

⚠ WARNING

If you do not wear your seat belt you could be thrown about inside the machine, or thrown out of the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.

8-2-9-2_1

⚠ WARNING

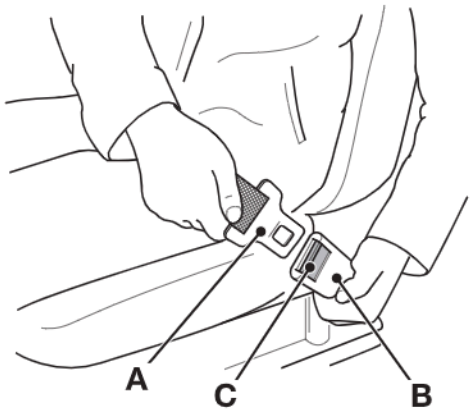
When a seat belt is fitted to your machine replace it with a new one if it is damaged, if the fabric is worn, or if the machine has been in an accident. Fit a new seat belt every three years.

2-3-1-7_1

Fasten the Seat Belt

1 Sit correctly in the seat. Pull the belt from its reel holder in one continuous movement.

2 Push the male fitting **A** into the buckle **B** until it latches into position. Make sure the seat belt is not twisted and that it is over your hips not your stomach.



C006840-1

Fig 17.

Note: *If the belt 'locks' before the male fitting **A** has been engaged, allow the belt to fully retract in its reel holder and then try again. The inertia mechanism may lock if you pull the belt too sharply or if the machine is parked on an incline. In such cases, ease the belt gently from its reel holder.*

Check the Seat Belt is Operating Correctly

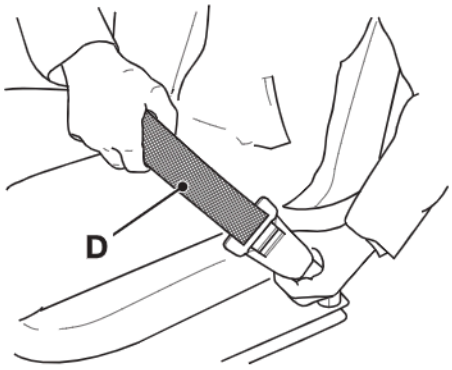
1 Sit correctly in the seat and fasten the seat belt as described.

2 Hold the middle of the seat belt as shown at **D** and tug. The seat belt should 'lock'.

⚠ 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



C006850-1

Fig 18.

Release the Seat Belt

⚠ WARNING

Release the seat belt only after switching off the engine.

2-2-1-10

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

2 Let the seat belt retract into its reel holder.

Cab Layout

Note: *The cab layout illustration is of a typical machine, for variations see the relevant page in this manual.*

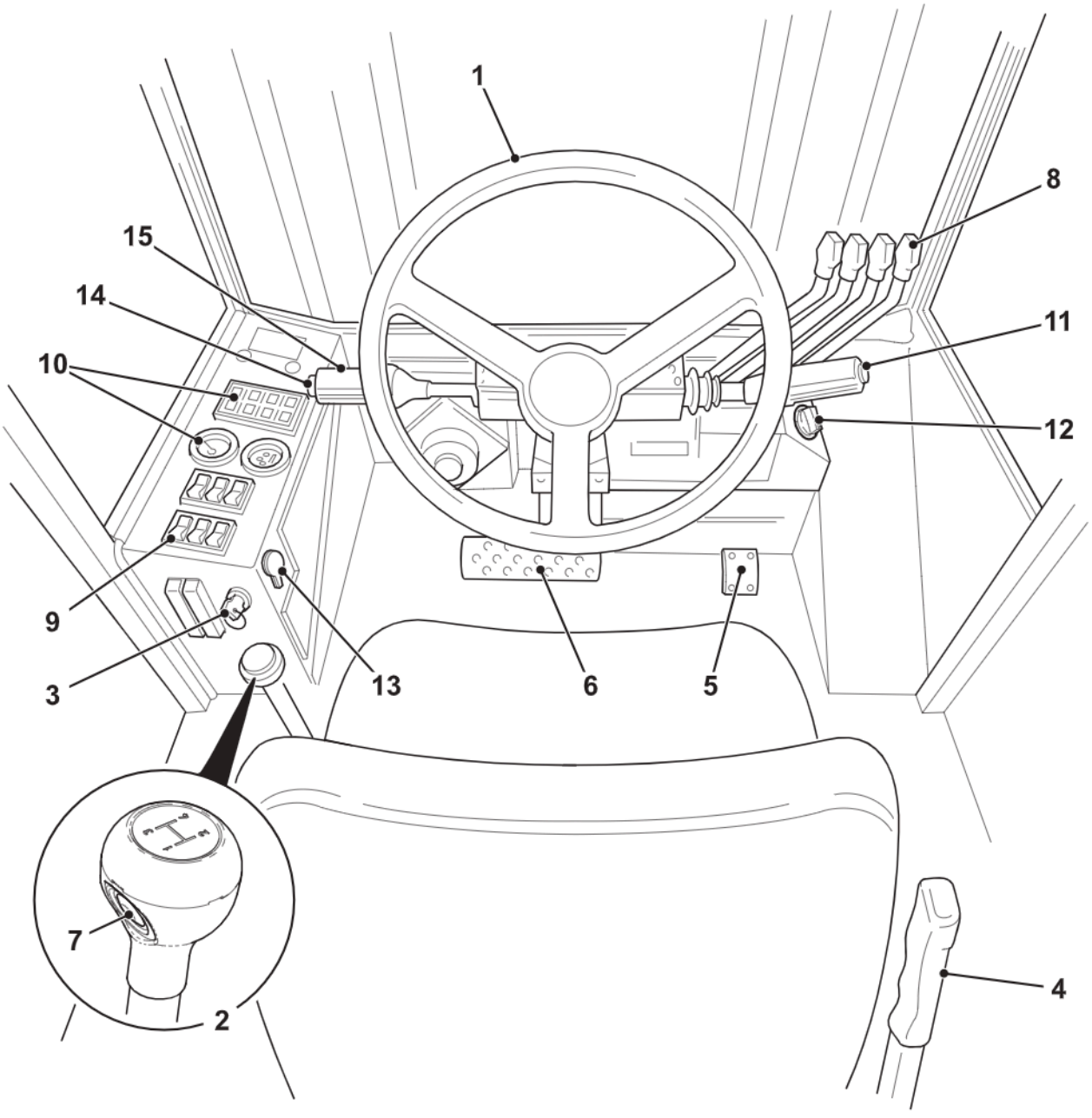


Fig 19.

Component Key

1 ⇒ *Steering Wheel (34)*.
2 ⇒ *Gear Lever (35)*.
3 ⇒ *Starter Switch (39)*.
4 ⇒ *Park Brake Lever (34)*.
5 ⇒ *Accelerator Pedal (34)*.
6 ⇒ *Foot Brake Pedal (34)*.
7 ⇒ *Transmission Dump (Disconnect) Switch (35)*.
8 ⇒ *Operating Levers (44)*.
9 ⇒ *Side Console (36)*.
10 ⇒ *Instrument Panel (41)*.
11 ⇒ *Multi-Purpose Steering Column Switch (38)*.
12 ⇒ *Heater Controls (43)*.
13 ⇒ *Auxiliary Power Socket (40)* (if fitted)(1)
14 ⇒ *Transmission Lever (34)*.
15 ⇒ *Horn (35)*.
16 ⇒ *Air Conditioning Controls (43)*.
17 ⇒ *Control Locks (48)*.

(1) Supply for 12 Volt accessories (Maximum 10 Amp).

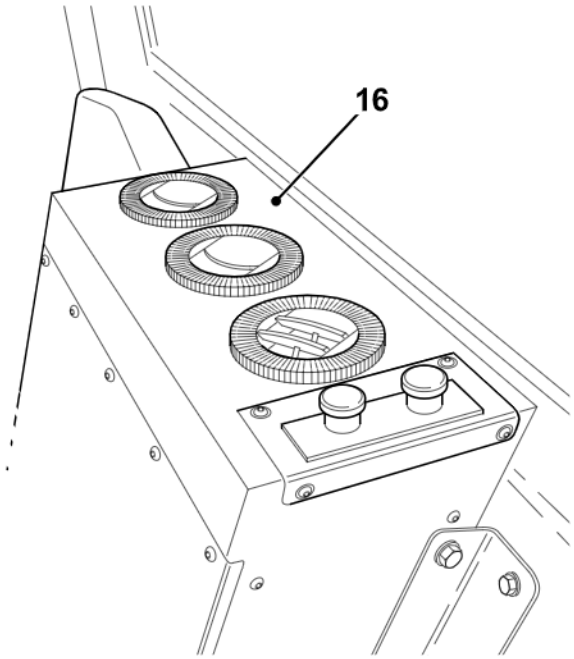


Fig 20.

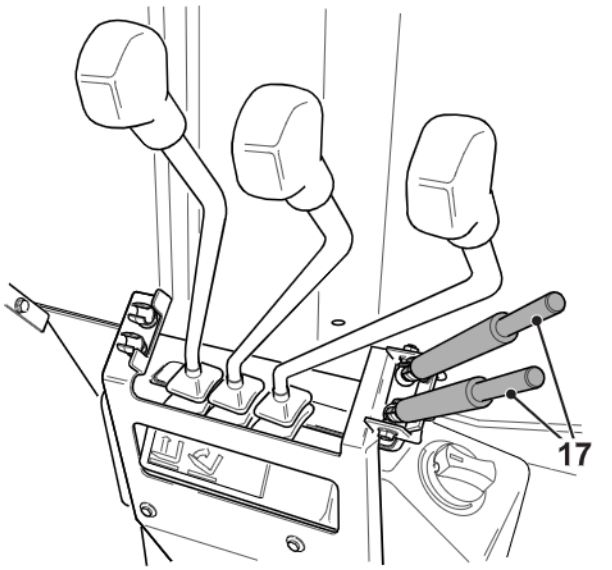


Fig 21.

Drive Controls, Switches and Instruments

Drive Controls

Steering Wheel

T2-048

Turn the steering wheel in the direction you want to go.

Accelerator Pedal

T2-011

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.

Foot Brake Pedal

Push down on the brake pedals 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.

Park Brake Lever

⚠ CAUTION

The park brake must not be used to slow the machine from travelling speed, except in an emergency, otherwise the efficiency of the brake will be reduced. Whenever the park brake has been used in an emergency, always renew both brake pads.

4-2-1-1_2

Use this lever to engage the park brake before leaving the machine. With the park brake engaged, an audible warning will sound and the Park Brake Engaged indicator will light when the forward/reverse lever is moved away from neutral.

To engage the park brake, pull the lever up. To release the park brake, simply lower the lever all the way.

When the park brake is engaged the transmission drive is automatically disconnected.

Transmission Lever

⚠ WARNING

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

2-2-2-4_2

Stop the machine before moving this lever. To select forward **(F)**, reverse **(R)** or neutral **(N)**, move the lever to the position shown. All four gears are available in both forward and reverse. When reverse is selected a back-up alarm will sound. The engine will only start if the lever is at neutral.

Note: *The forward/reverse lever will be one of two types, **A** or **B**. ⇒ Fig 22. (🗋 35). Type **B** is equipped with a hinged lockplate **C**. This enables the lever to be locked in the neutral position when drive is not required. Type **A** has no lockplate but the lever must be lifted to allow selection of forward or reverse.*

Procedure for reversing direction:

1. Stop the machine; keep the foot brake applied.
2. Let the engine speed drop to idle.
3. Select the new direction.
4. Release the foot brake and accelerate away.
5. If the park brake is engaged when the forward/reverse lever is moved away from neutral an audible alarm will sound and the Park Brake Engaged Indicator will light.

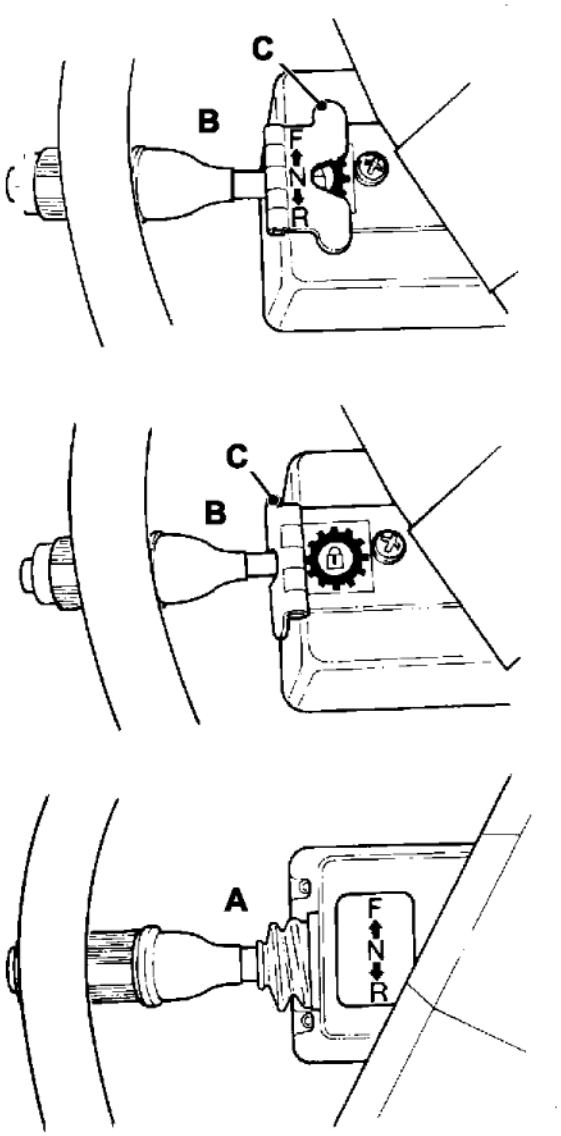


Fig 22.

Horn

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

Gear Lever

To select a gear, move the lever as shown on the shift pattern. When the machine is stationary, make sure the forward/reverse selector is at neutral **(N)** and the engine at idle before selecting a gear. The machine can be moved off in any gear depending on ground conditions.

To change gear on the move:

1 Press the transmission dump switch **7**.

2 Select the new gear.

3 Release the transmission dump switch.

4 Use the accelerator **5** to produce a smooth gear change.

Transmission Dump (Disconnect) Switch

Push this switch to disconnect the drive while changing gear on the move. Note that it is not a clutch. It cannot be 'slipped'. Do not use it for 'inching' the machine.

To inch the machine, keep it in a low gear, with your foot off the accelerator pedal, and use the foot brake to control the motion.

Switches

Console Switches

Introduction

SW-001_2

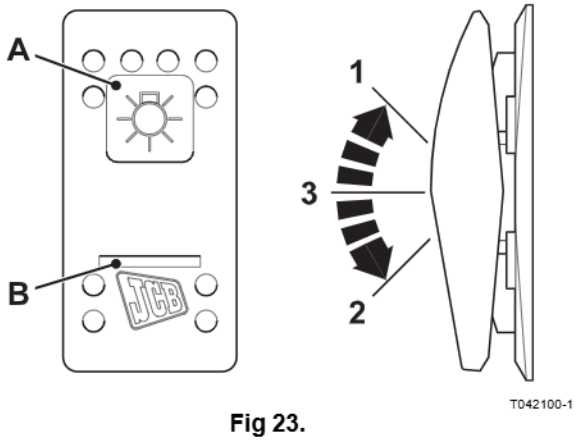
The installed switches and their positions can change according to the specification of the machine.

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

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

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

The light bar **B** comes on to show that the switch function is active.

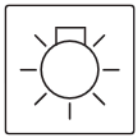


T042100-1

Fig 23.

Side Console

Side Lights and Headlights



340151-1

Three position rocker switch with backlight. The switch functions operate when the starter switch is in the ON and OFF positions.

Position **1**: OFF (Backlight OFF)

Position **3**: Side Lights ON (Backlight ON)

Position **2** (starter switch in the ON position): Headlights ON (Backlight ON)

Position **2** (starter switch in the OFF position): Side Lights ON (Backlight ON)

Machines without headlights or side lights are designed for site use. You may be breaking local laws if you travel on the road without headlights or side lights.

Hazard Warning Lights



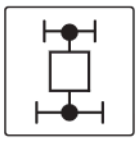
339861-1

Two position rocker switch with backlight. The switch functions operate when the starter switch is in the ON and OFF positions.

Position **1**: OFF (Backlight OFF).

Position **2**: ON (Backlight ON). A light on the instrument panel flashes with the outside lights.

2/4 Wheel Drive Selector



339650-1

Two position rocker switch with backlight. The switch functions operate when the starter switch is in the ON position.

Position **1**: 2-Wheel drive engaged (Backlight OFF).

Position **2**: 4-Wheel drive engaged (Backlight ON).

Before you operate the switch, refer to ***Getting the Machine Moving***.

Beacon


339711-1

Two position rocker switch. The switch functions operate when the starter switch is in the ON and OFF positions.

Position **1**: OFF

Position **2**: ON

Before you operate the switch, refer to ***Beacon***.

⚠ WARNING

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

2-2-2-5_1

Front Work Lights


340100-1

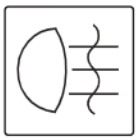
Two position rocker switch. The switch functions operate when the starter switch is in the ON position.

Position **1**: OFF

Position **2**: Outer Work Lights ON

Note: *The work lights work independently of the main lights circuit.*

Rear Fog Light (if fitted)

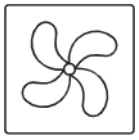

340051-1

Two position rocker switch. The switch functions operate when the starter switch is in the ON position.

Position **1**: OFF

Position **2**: ON

Cab Heater (if fitted)


339681-1

Three position push switch. The switch functions operate when the starter switch is in the ON position.

Position **1**: OFF

Position **3**: ON - 1st Speed

Position **2**: ON - 2nd Speed (if fitted)

Before you operate the switch, refer to ***Air-Conditioning and Cab Heater Controls***.

Air-Conditioning (if fitted)


339681-1

Two position rocker switch. The switch functions operate when the starter switch is in the ON position.

Position **1**: OFF

Position **2**: ON

Before you operate the switch, refer to ***Air-Conditioning and Cab Heater Controls***.

Multi-Purpose Steering Column Switch

Note: *The steering column switch on your machine may not include all of the following functions.*

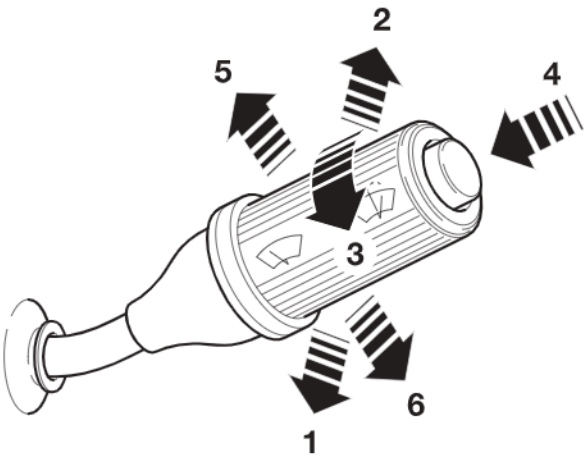


Fig 24.

1 Direction indicators (Right)

Pull the lever towards you to indicate a right turn. Switch the indicators off when you have completed the turn. Functions only with the starter switch at position **I**.

2 Direction indicators (Left)

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 at position **I**.

3 Windscreen Wiper

Rotate the lever barrel to switch the windscreen wipers on and off. The following functions are available (only with the starter switch turned on).

J Not Used

0 Off

I On

II Not Used

4 Windscreen Washer

Push the button towards the steering wheel to operate the windscreen washer. Functions only with the starter key at position **I**.

5 Headlights Flash

Lift the lever to flash the headlights. Functions only with the starter switch at position **I**.

6 Headlight/Mainbeam

Push the lever down for high beam. Centre position is dipped beam. Functions only with the side/head lights on.

Starter Switch

This is a rotary switch **A**, operated by the starter key. It has four positions. The key can be removed only with the switch set to **0** (Off).

0 Off/Stop Engine. Turning the key to this position will stop the engine. Make sure the transmission is in neutral, the attachments have been lowered and the park brake is engaged before stopping the engine.

IG/I On. Putting the switch to this position connects the battery to all electrical circuits except the lights and hazard warning circuits. (The lights and hazard warning circuits are permanently live). The starter key will spring back to this position when it is released from positions **H/II** or **HS/III**. At -6°C (21°F) warning light 5 will illuminate to indicate the cold start inlet manifold heater has come on (if fitted). ⇨ *Warning Lights (42)*.

H/II This position is not used in this application.

HS/III Start position. Operates the starter motor to turn the engine.

Note: *Do not operate the starter motor for more than 10 seconds without the engine firing. If the engine fires but does not fully start, do not operate the starter motor for more than 40 seconds. Let the starter motor cool for at least two minutes between starts.*

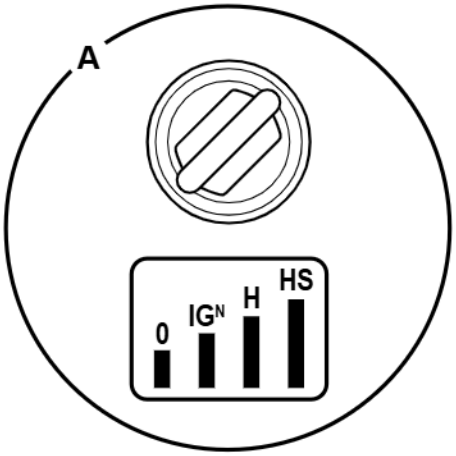


Fig 25.

Rear Window Wiper

Rocker switch **A**. Press down to switch on rear window wiper. The wiper does not self-park. It functions only with the starter switch on.

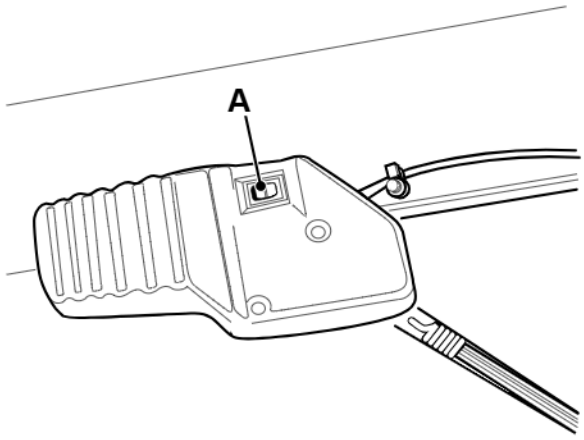


Fig 26.

Roof Window Wiper

Rocker switch **B**. Press down to switch on roof window wiper. The wiper does not self-park. It functions only with the starter switch on.

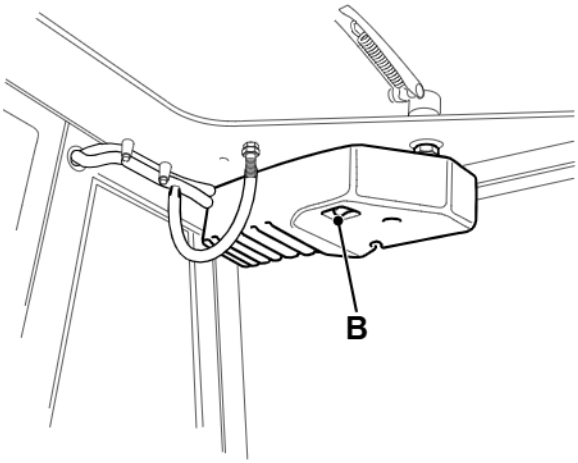


Fig 27.

Auxiliary Power Socket

The socket **X** supplies a 12 Volt DC power supply to electrical accessories (from the battery). Only connect items which are compatible with the power rating of the socket (Refer to ***Electrical System, Fuses***) and have the correct plug.

Always operate the engine during prolonged use of electrical accessories, otherwise the battery can discharge.

Make sure that the socket cap is closed when the socket is not in use.

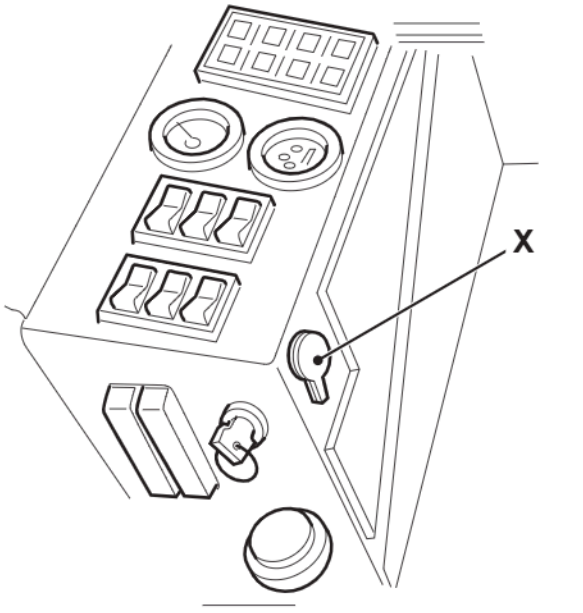


Fig 28.

Instrument Panel

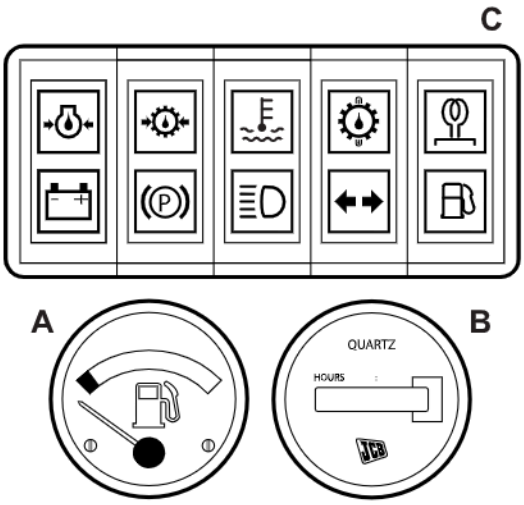
The instruments and indicator lights are grouped together on an instrument panel. ⇨ *Fig 29. (41)*.

Instruments provided are a hourmeter 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.)



340830-3

Fig 29.

Instruments

A Fuel Gauge

Indicates the level of diesel fuel in the tank. Do not let the tank run dry, or air will enter the fuel system.

Note: *At the end of every working day, fill the tank with the correct type of fuel. This will prevent overnight condensation from developing in the fuel.*

B Hourmeter

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

C Warning Lights

⇨ *Warning Lights (42)*.

Warning Lights

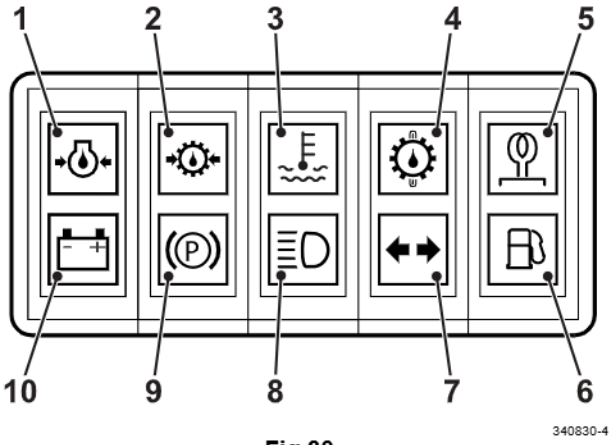


Fig 30.

⚠ CAUTION

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

4-2-1-2

1 Engine Oil Pressure Low

Audible/Visual. Lights if the engine oil pressure falls too far. The light should go out a few seconds after the engine is started.

2 Transmission Oil Pressure Low

Audible/Visual. Lights if the transmission oil pressure falls too far. The light should go out a few seconds after the engine is started.

3 Engine Coolant Temperature High

Audible/Visual. Lights if the engine coolant temperature rises too far.

4 Transmission Oil Temperature High

Audible/Visual. Lights if the transmission oil temperature rises too far.

5 Cold Start (If fitted)

Visual Only. With the starter switch in position **III**, if the outside air temperature is -6°C (21°F) or below the light will illuminate indicating that the manifold heater is ON. When the light extinguish the engine is ready to start.

6 Water in Fuel Indicator

Audible/Visual. Lights up when there is water in the fuel system. Drain the water separator and engine filter.

7 Direction Indicators

Visual Only. Flashes with the left and right direction indicators. Use the direction indicators to signal before turning the machine.

8 Main Beam On

Visual Only. Lights when the headlight main beams are switched on. Switch the main beam off for oncoming vehicles.

9 Park Brake Engaged

Audible/Visual. Lights if Forward or Reverse drive is selected while the park brake is engaged.

10 No Charge

Audible/Visual. 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.

Air Conditioning and Heater Controls

Heater Controls

Hot air is directed to the windscreen by a pipe in the front of the cab. It is directed to the cab through a shutter **A** on the heater unit. A heater control switch **B** controls a two-speed heater fan.

Air Control

Rotate vent **A** open to direct air into the cab. Rotate the vent **A** closed to direct all the air to the windscreen.

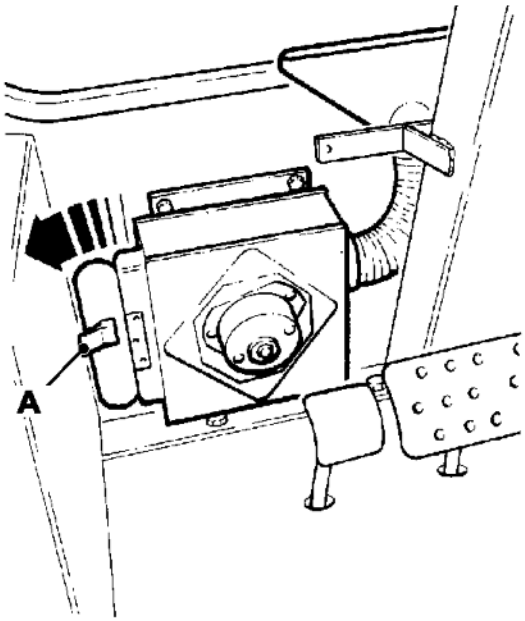


Fig 31.

Air Conditioning Controls

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

Air conditioning reduces moisture from the air and can be used to demist windows quickly in damp weather. Used in conjunction with the heater, it also makes the interior of the cab warm and dry.

Important: *Operate the air conditioning for at least 10 minutes per month.*

1 Start the engine. ⇨ ***Starting the Engine*** (53).

Note: *Before starting the engine make sure the air conditioning is switched off (knob **A**, position **0**).*

2 Turn knob **A** clockwise to position **1** to turn the air conditioning on. Turn to position **2** to increase speed.

To obtain best results from the air conditioning system ensure that all doors and windows are closed.

3 Turn knob **B** counter-clockwise to raise the temperature. Turn the knob in the opposite direction to reduce the temperature.

4 Position vents **C** as required to direct air.

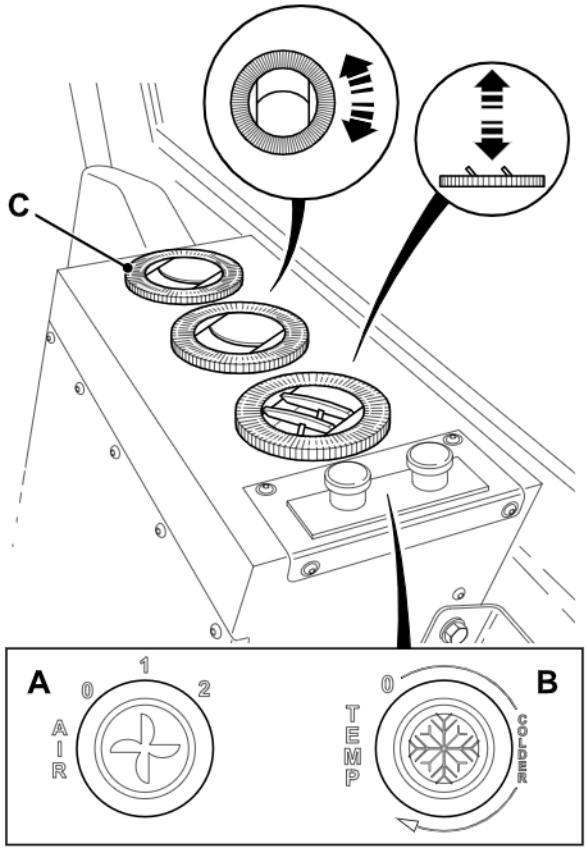


Fig 32.

Operating Levers

Introduction

⚠ WARNING

Controls

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

0179_2

⚠ WARNING

Mast/Travelling

Operating the mast and carriage while travelling can cause accidents. You will not have total control. Never operate the mast and carriage while travelling.

9-1-3-2

⚠ WARNING

Electrical Power Cables

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

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

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

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

2-2-5-4

⚠ WARNING

Make sure that it is clear overhead before raising the mast.

9-2-1-2

The mast and its carriage are operated by levers **1** and **2**. Your machine may have up to two additional levers **3** and **4**. These operate optional services when fitted. ⇨ *Auxiliary Controls (46)*.

⚠ WARNING

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

5-2-2-9_2

All levers move forward and back. 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. (The mast descends by gravity, at a speed which is controlled by a flow regulator in the hydraulic circuit).

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

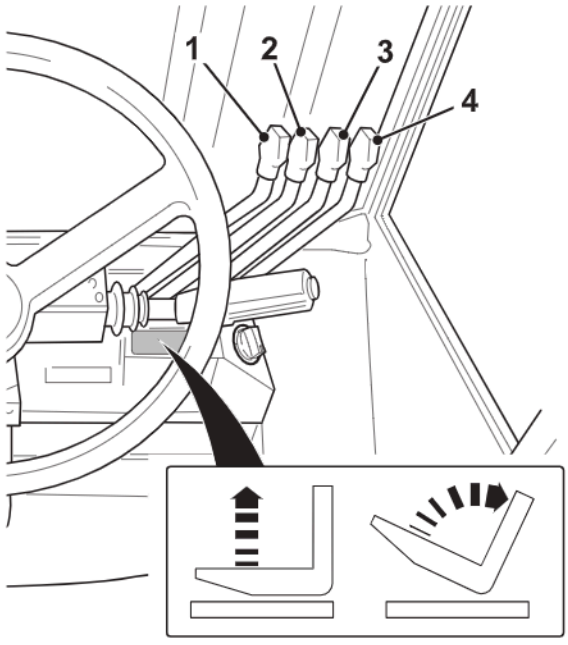


Fig 33.

Mast Controls

Raise Mast / Lower Mast

To raise the mast **A** (and carriage), pull the lever back. To lower the mast **B** (and carriage), push the lever forward.

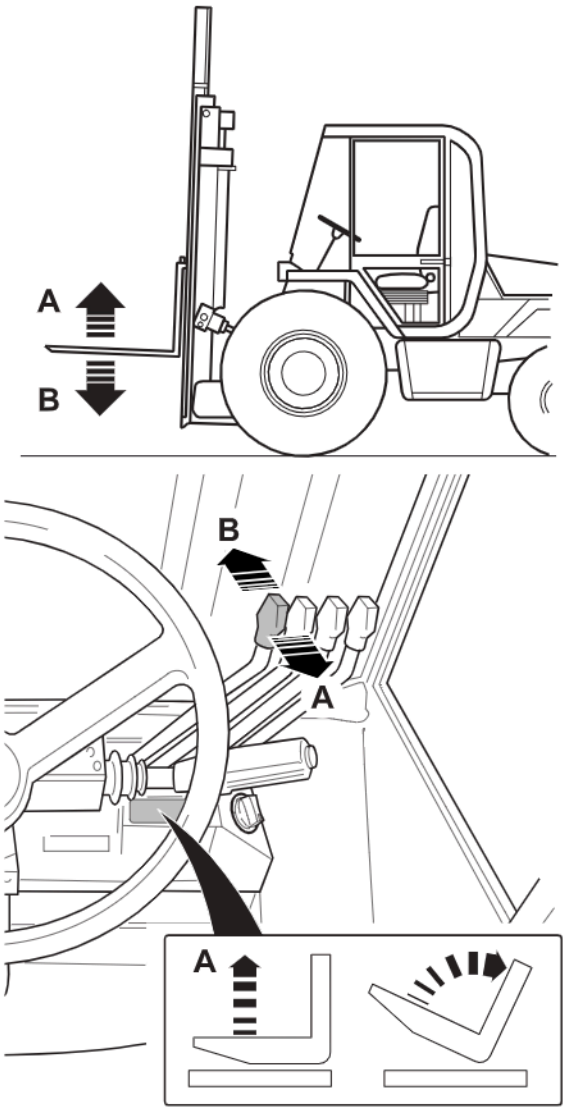


Fig 34.

Tilt Mast Forward/Tilt Mast Back

To tilt the mast forward **C**, push the lever forward. To tilt the mast back **D**, pull the lever back.

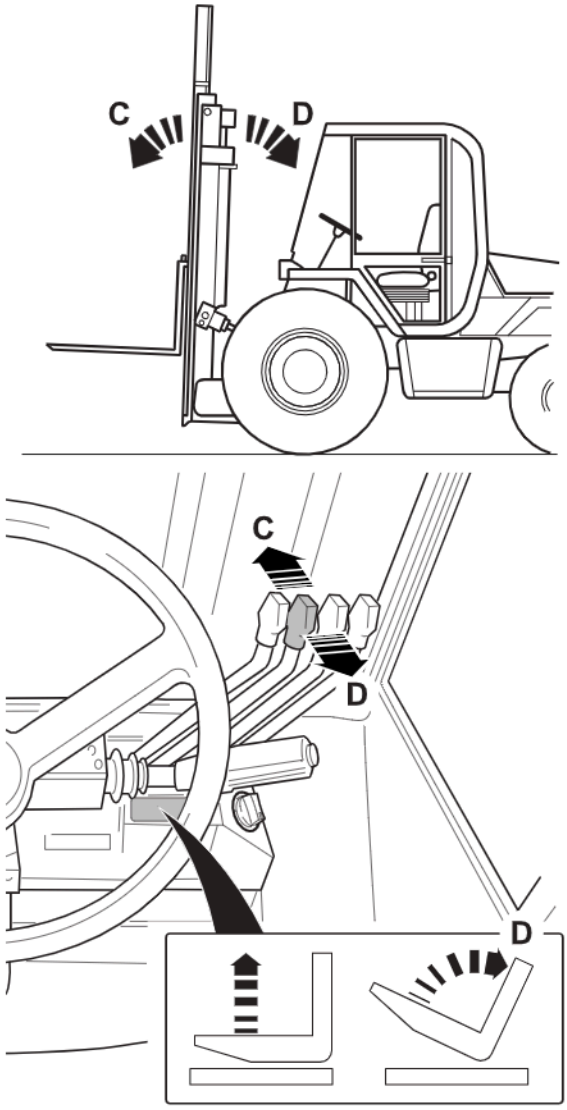


Fig 35.

Auxiliary Controls

The machine can be fitted with a single or twin auxiliary circuit. These can be used to operate optional attachments when connected to the quick release couplings **J** mounted at the front of the machine. ⇨ *Optional Attachments (🗋 163)*.

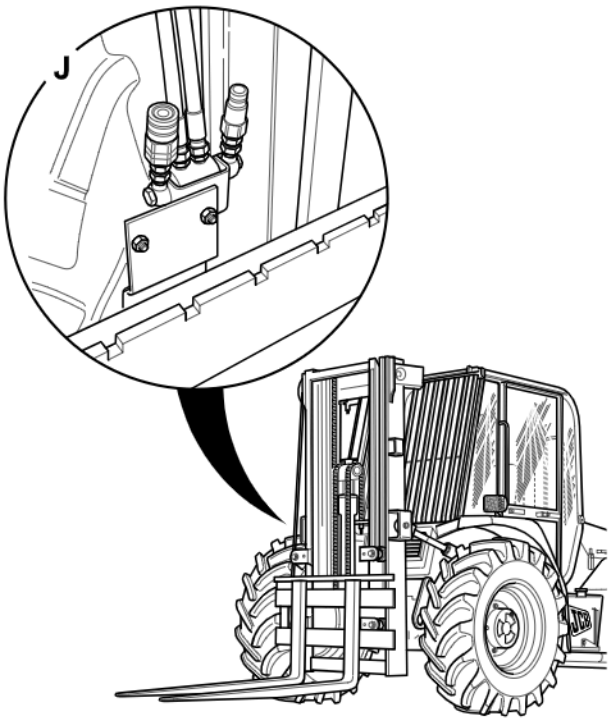


Fig 36. Single Auxiliary Installation

Single Auxiliary Option

To operate the auxiliary circuit:

- On machines fitted with a standard carriage, move lever **3** in direction **G** or **H** depending on the attachment fitted or the function required.
- On machines fitted with a Sideshift carriage, move lever **4** in direction **G** or **H** depending on the attachment fitted or the function required.

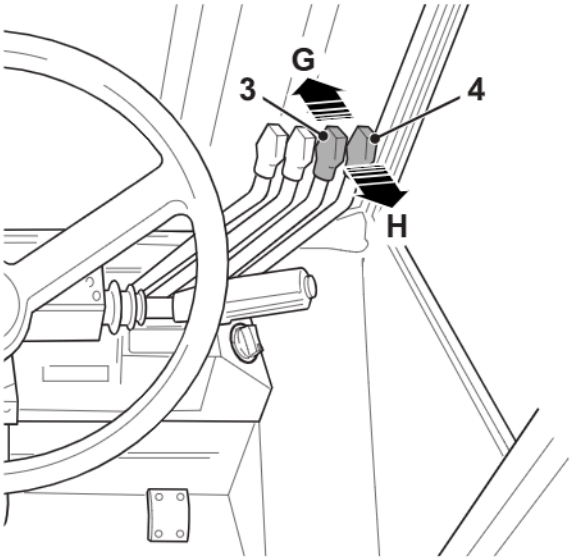


Fig 37.

Twin Auxiliary Option

To operate the auxiliary circuit, move lever **3** or **4** in direction **G** or **H** depending on the attachment fitted or the function required.

Sideshift Carriage (if fitted)

If the machine is fitted with a sideshift carriage it can be operated by lever **3**. To move the carriage to the left **E**, push the lever forward. To move the carriage to the right **F**, pull the lever back.

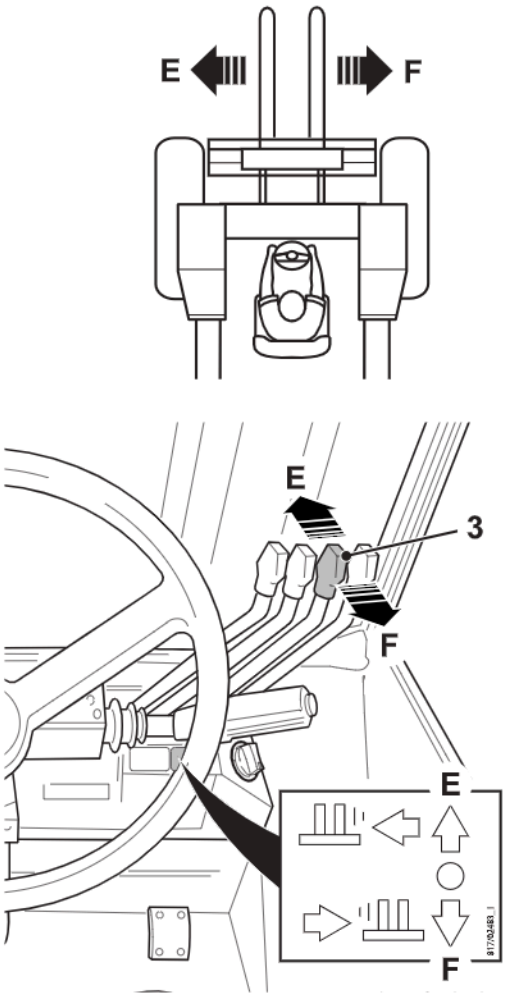


Fig 38.

Safety Equipment

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 are designed to lock or isolate the controls in the neutral position.

Lock the controls before you travel on public roads.

To lock the controls:

1 Make sure that the control levers **A** are in the neutral position.

2 Lower the locking bars **B** into the horizontal position. ⇨ *Fig 39. (48)*.

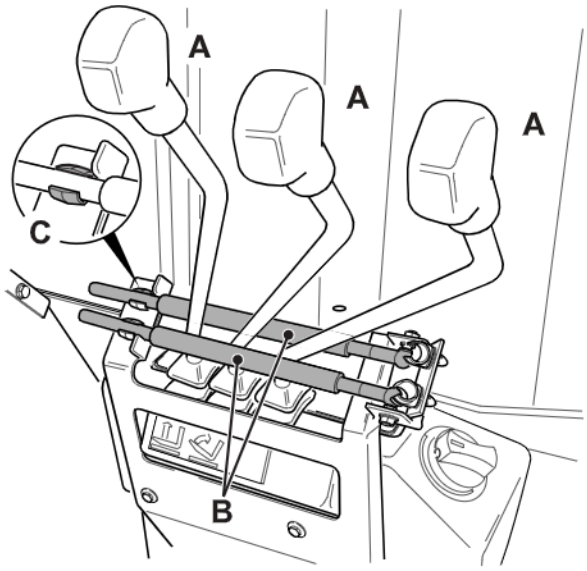
3 Push the locking bars into clips **C** to secure the control levers in the locked position.

4 Before you start the engine, make sure that the controls are locked.

To release the controls:

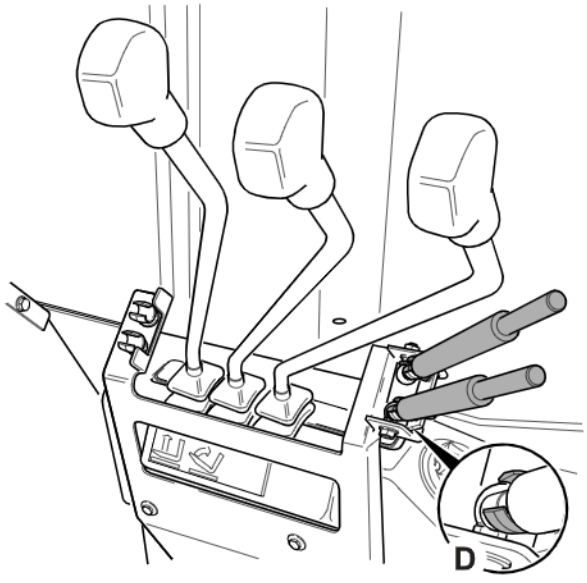
1 Raise the locking bars into the vertical position. ⇨ *Fig 40. (48)*.

2 Push the locking bars into clips **D** to secure the control levers in the locked position.



T011630-2

Fig 39. Controls Locked



T011630-3

Fig 40. Controls Unlocked

Beacon

In certain territories you will be breaking the law if you do not fit a rotating beacon before you travel on public highways - make sure you are complying with local laws.

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

1 Put the beacon **A** on the cab roof.

Note: *The beacon is held in position by a magnetic base.*

2 Put the plug **B** into the cab roof socket **C**.

3 Use the switch **D** to operate the beacon. The indicator light in the switch comes ON when the beacon is operating.

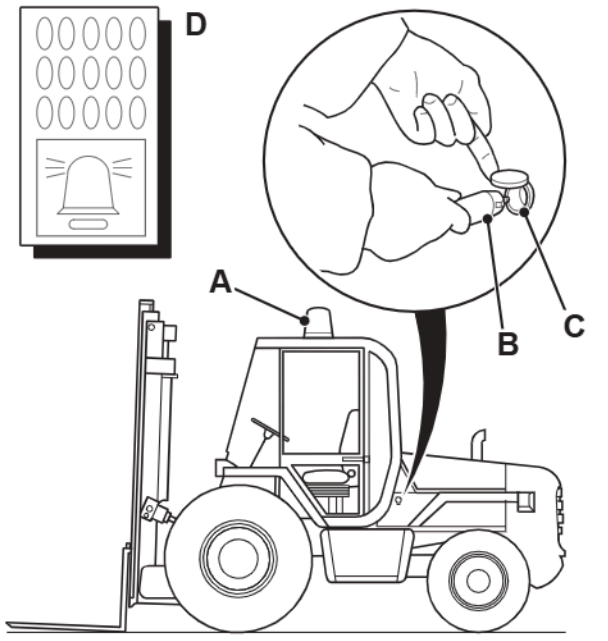


Fig 41.

Fire Extinguisher (If fitted)

Location

The fire extinguisher is found under the seat and is held in position by a stowage bracket. Keep the fire extinguisher in this position until you need to use it.

Operation

T2-041_3

⚠ WARNING

Do not use the fire extinguisher in a confined space. Make sure that the area is well ventilated during and after using the fire extinguisher.

4-2-3-1

⚠ WARNING

After any use, the extinguisher should be replaced or serviced.

4-2-3-2

Make sure that you understand how to use the fire extinguisher. If necessary, refer to the instructions found on the fire extinguisher.

Only try to extinguish a fire if the circumstances permit and your safety is not endangered. If necessary, contact your nearest fire department.

Using the fire extinguisher:

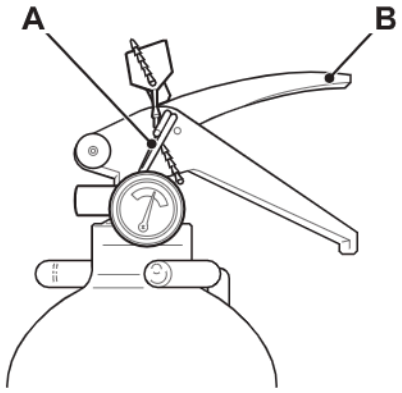
1 If the circumstances permit and your safety is not endangered, move the machine to a safe place to prevent the fire from spreading.

2 Remove extinguisher from its stowage bracket.

3 Remove safety pin **A**.

4 Aim directly at the fire from an upwind position, if possible.

5 Squeeze trigger **B** to operate the extinguisher, release the trigger to stop the flow.



S170520-3

Fig 42.

The fire extinguisher should be inspected daily. Refer to ***Routine Maintenance, Fire Extinguisher (if fitted)***.

Before Starting the Engine

P5-2033_4

Note: *Read* ***Operating Environment*** *in Operation section if you will be using the machine in very cold or very hot climates.*

Note: *If the fuel tank has been empty or if any part of the fuel system has been drained or disconnected, the fuel system must be primed before attempting to start the engine. See* ***Bleeding the System****, Maintenance section.*

1 The park brake should have been engaged when the machine was last parked. But if it is not already engaged, engage it now.

⚠ DANGER

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

2-2-3-4

2 Make sure that the attachment is on the ground.

⚠ CAUTION

On machines fitted with hose burst protection valves the attachments cannot be lowered with the engine stopped. On these machines start the engine and lower the attachments before doing the walk round inspection.

2-2-3-5

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 walk round inspection of the outside of the machine. See ***Before Entering the Cab***. Also, complete the daily checks as detailed in the Service Schedules.

b Remove dirt and rubbish from the cab interior, specially 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 could 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 could 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. Make sure all its securing bolts are fitted and correctly tightened.

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

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

⚠ WARNING

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

2-3-1-7_1

i Check that the following are in working order:

Lights, Warning Lights, Horn, Indicator Lights, All Switches, Direction Indicators, Hazard Warning Lights, Windscreen Washer and Wipers (if fitted).

4 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.

5 If fitted, adjust the armrest so that you can reach and operate the controls without stretching.

6 If possible, adjust the steering column so that you can reach the steering wheel and the steering column switches without stretching.

7 If fitted, set the rear view mirror(s) to give you a good view close behind the machine when you are correctly seated.

8 Fasten the seat belt.

Starting the Engine

Note: *Control and switch locations are provided within this publication.* ⇨ ***Cab Layout (32)***.

1 Read and comply with ***Before Starting The Engine***.

2 Put the Forward, Reverse lever in neutral.

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

3 Put the gear lever in neutral.

4 The battery isolator key must be fitted and switch on before attempting to start the engine.⇨ ***Battery Isolator (if fitted) (127)***.

⚠ 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 and get into fresh air.

INT-2-1-10_2

5 Start the engine.

a Normal engine start.

i Slightly depress the accelerator pedal **D**.

Note: *If the temperature is above -6°C (21°F), the cold climate heater warning light will flash momentarily to indicate the system is functioning correctly.* ⇨ ***Warning Lights (42)***.

ii Turn the starter switch **E** to position **III** and hold it there until the engine starts.

b Cold climate engine start, -6°C (21°F)(if fitted).

i Turn the starter switch **E** to position **I**, the cold start inlet manifold heater warning light will come ON. ⇨ ***Warning Lights (42)***.

ii Fully depress the accelerator pedal to the floor.

iii When the warning light goes OFF, turn the starter switch to the 'start' position **III** and hold it there until the engine starts.

Note: *Do not operate the starter motor for more than 10 seconds without the engine firing. If the engine fires but does not fully start, do not operate the starter motor for more than 40 seconds. Let the starter motor cool for at least two minutes between starts.*

6 Release the starter key as soon as the engine starts. The switch will return to 'IGN' position **I**.

⚠ WARNING

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

7 Ease off on the accelerator pedal to reduce engine speed.

8 Once the engine has started, check that all the warning lights have gone off. Do not race the engine until the oil pressure low light has gone out. ⇨ ***Warning Lights (42)***. Check that the audible alarm is silent.

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

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

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.*

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).*

Preparing the Machine for Travel

Introduction

When you travel on the road or on site there are usually local rules and safety regulations for the machine travel position. The ***Preparing for Road Travel*** and ***Preparing for Site Travel*** described on the following pages are recommendations that should help you meet the requirements of these regulations; they are not necessarily the applied law.

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

Preparing for Road Travel

Important: *Machines without headlights and sidelights are designed for site use, you may be breaking local laws if you travel on the road without headlights or sidelights.*

1 Remove the Forks or if regulations permit, fit marker plates to warn oncoming traffic. The plates must be illuminated in poor visibility. ⇨ ***Changing the Forks (🗋 159)***

2 Centralise the carriage. Tilt the mast fully back. Lower the carriage so that the heels of the forks (if fitted) are 100 mm-150 mm (4 in-6 in) above the ground.

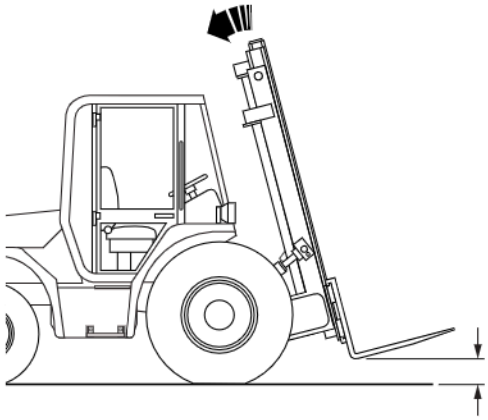


Fig 43.

3 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').

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

Important: *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.*

⚠ CAUTION

Do not travel on public roads with the machine loaded.

5-2-3-1

4 If any optional attachments are fitted, make them safe as detailed in the manufacturer's instructions.

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

Note: *In certain countries i.e. Italy, legislation requires safety marker plate to be fitted before travelling on public roads.*

5 Check that the road lights are working correctly.

6 The traffic regulations may require you to have a beacon operating on some public roads. ⇨ ***Beacon (🗋 49)***.

7 Select 2-wheel drive.

Site Travel Position

The recommendations given below ARE NOT necessarily the applied law, please make sure you are complying with the relevant local laws.

1 Centralise the carriage. Tilt the mast fully back. Lower the carriage so that the heels of the forks (if fitted) are 100 mm-150 mm (4 in-6 in) above the ground.

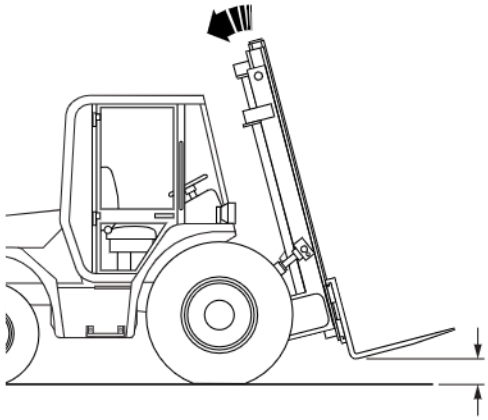


Fig 44.

Getting the Machine Moving

Operating Practices

P5-2020_2

⚠ WARNING

Hillsides

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 over work the engine unnecessarily by using too high a gear for example, on a hill. Operating in too high a gear will overheat the torque converter fluid.

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

⚠ WARNING

Do not dismount a moving machine.

3-2-3-12

Do not use the pedals as footrests.

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

⚠ WARNING

Slopes

Always drive a LOADED machine FORWARD UPHILL and in REVERSE DOWNHILL.

Always drive an UNLOADED machine in REVERSE UPHILL and FORWARD DOWNHILL.

9-1-3-3

Do not turn on or drive across a slope.

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

If the load will be pushing the machine on a downslope, select first gear (1) before starting downhill.

Use the brake pedal to prevent overspeeding down a slope.

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

Take particular care when reversing. If the machine has mirrors, make sure your view of the 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 and jump from the cab. Stay in the cab, with your seat belt fastened.

INT-2-1-12

Limited Slip Differential (LSD)

T2-003

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.

Operating Procedure

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

Note: *Control and switch locations are provided within this publication.* ⇨ ***Cab Layout (🗋 32)***.

1 Check your seat belt and seat.

a Make sure that your seat belt is correctly fastened.

b Make sure that the seat is correctly adjusted.

2 Select 2- or 4-Wheel Drive (if fitted). Do not use 4-wheel drive on the road or hard surfaces. It will cause excessive tyre wear.

3 Press the transmission dump switch. Select a gear to suit the conditions and the job you will be doing and release the dump switch.

Note: *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.*

Note: *Depending on the ground conditions 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.*

⚠ WARNING

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

2-2-2-4_2

4 Select Forward or Reverse and move off.

⚠ WARNING

Travelling at High Speeds

Travelling at high speeds can cause accidents. Do not reverse in a high gear with full throttle. Always travel at a safe speed to suit working conditions.

INT-5-3-3

a Check the carriage is in the travel position.

b Push the brake pedal hard down.

c Lift the forward/reverse lever from its detent position and select forward or reverse.

Note: *When forward or reverse drive is selected, an audible alarm will sound and a warning light will show to remind you that the park brake is still engaged.*

d Release the park brake.

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

⚠ 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

f 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.

5 To change gear when the machine is moving, press the dump switch, select a gear and release the dump switch.

Stopping and Parking the Machine

Note: *Control and switch locations are provided within this publication.* ⇨ ***Cab Layout (32)***.

1 Stop the machine on dry and level ground where the machine will not be a hazard or danger.

⚠ WARNING

Parking

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

INT-2-2-4_2

2 Ease up on the accelerator pedal and down on the brake pedals to bring the machine to a smooth stop. Keep the foot brakes on until the park brake has been pulled on.

⚠ CAUTION

The park brake must not be used to slow the machine from travelling speed, except in an emergency, otherwise the efficiency of the brake will be reduced. Whenever the park brake has been used in an emergency, always renew both brake pads.

4-2-1-1_2

3 Pull the park brake lever fully up. Make sure that the park brake indicator lights up. Release the foot brakes.

Note: *An audible alarm will sound when the park brake is engaged with the machine in forward or reverse drive. The alarm will stop when the drive is disengaged (see Step 4).*

⚠ WARNING

Do not dismount a moving machine.

3-2-3-12

4 Set the forward/reverse lever to neutral. Make sure the lever is in its detent position.

5 Select neutral gear.

⚠ DANGER

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

2-2-3-4

⚠ WARNING

Mast and Carriage

Even with the engine stopped, the mast and carriage will descend if the control lever is moved. If the mast is not tilted fully forward it will move if the control lever is moved. Never leave the machine without fully lowering and tilting the mast.

9-1-3-4

6 Rest the forks flat on the ground.

⚠ CAUTION

Rams

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

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

8 Use the handholds and step when you climb down from the machine. If you are leaving the machine, close and latch all windows and lock both doors. Make sure that the filler cap is locked on.

⚠ WARNING

Entering/Leaving

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

Working with the Machine

Operating Practices and Site Safety

T2-057_2

This section explains some techniques and procedures for efficient and safe use of the machine and its attachments. Attention is also drawn to the various safety aspects of operating on site.

Read and understand this section before you start working with the machine.

Make sure that you have had adequate training and that you are confident in your ability to operate the machine safely before you use it. Practice using the machine and its attachments until you are completely familiar with the controls and what they do.

With a careful, well trained and experienced operator, your machine is a safe and efficient machine. With an inexperienced or careless operator, it can be dangerous. Do not put your life, or the lives of others, at risk by using the machine irresponsibly.

Before you start to work, tell your work mates what you will be doing and where you will be working. On a busy site, use a signalman.

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

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

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

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

There are a wide variety of situations in which your machine 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.

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 and gives no warranty or representation of assurance in respect of the accuracy of the same.

Remember that your machine is mobile. Whenever possible, manoeuvre it into a position which combines safety and efficiency. But if you have to choose, always remember that: Safety must come first.

Clothing and Safety Equipment

T2-069

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

Danger Zone

T2-046_2

The danger zone means any zone within and/or around machinery in which a person is subject to a risk to his health or safety. During operation of the machine, keep all persons out of the danger zone. Persons in the danger zone could be injured. Refer to ***Specifications.***

Before performing maintenance tasks make the machine safe. Refer to ***Make the Machine Safe.***

Log Moving/Handling

T2-047

Do not use the machine to move or handle logs unless it has been fitted with adequate log protection. You could cause serious injury to yourself and damage the machine. Contact your JCB dealer.

Safety Practices

P2-2019_3

Read ***Operating Safety (Introduction Section)***, plus the following information.

⚠ WARNING

Reworking Old Sites

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

2-2-5-5

⚠ WARNING

Water Supplies and Drains

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

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

2-2-5-6

⚠ WARNING

Fibre Optic Cables

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

8-2-9-20

⚠ WARNING

Underground Gas Pipes

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

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

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

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

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

Leaking gas is highly explosive.

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

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

2-2-6-1_1

Working with the Mast

Introduction

⚠ 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

⚠ WARNING

Safe Working Loads

Overloading the machine can damage it and make it unstable. Study the Rating Plate in the cab before using the machine.

Remember that mast attachments may reduce the machine's lifting capacity.

9-1-2-1

⚠ 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

⚠ WARNING

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

0020

⚠ 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

⚠ CAUTION

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

Do not exceed the loading limits shown on the Rating Plate.

9-2-2-5

⚠ 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 at full load capacity. Drive carefully over bumps and kerbs. Do not operate the mast and carriage controls while the machine is moving.

9-2-2-4_1

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

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.

Risk Assessment

⚠ 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.

0074

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.

The following 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.

Important: *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.*

General

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

However, your machine 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.

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 the machine in it's normal travelling mode, that is with the upper surface of the heels of the fork arms not more than 100mm-150mm (4-6in) 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.

Observe the maximum wading depth of this machine. Water can enter the engine and axles, and the cooling fan can be damaged if the machine is operated in deeper water.

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?

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.

Lifting and Loading Operations

P5-2067

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.

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 Section)***. 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.

All lifting equipment, including forks and their mountings, need regular inspection and testing by a competent person to ensure they are fit for purpose. Refer to ***Fit for Purpose Tests for Lifting Equipment (Routine Maintenance Section)***.

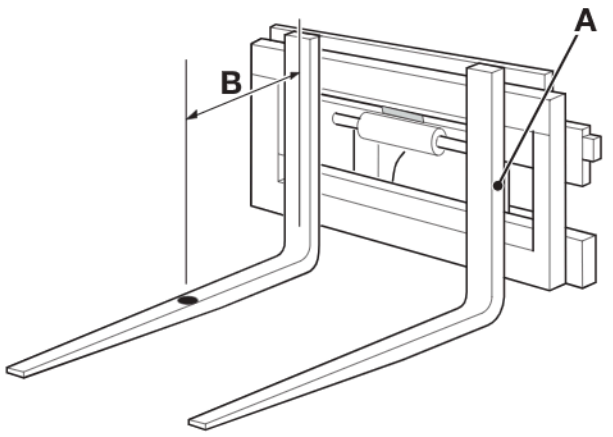


Fig 45.

Repositioning the Forks

⚠ WARNING

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

0002

⇨ *Changing the Forks (🗋 159)*

There are two types of fork carriage that can be fitted, depending on which type you have, use either of the following instructions:

Industrial Carriage Fork Adjustment

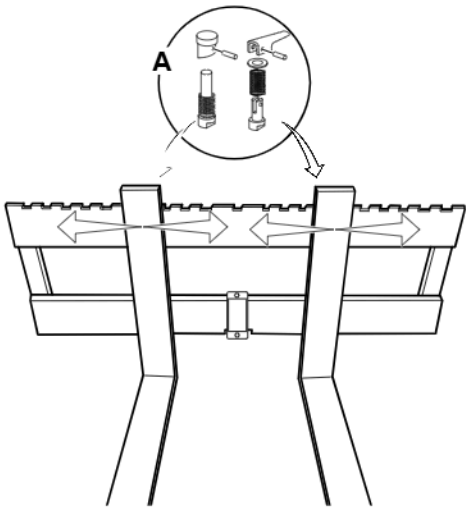
1 Park the machine on solid level ground.

2 Make sure the park brake is engaged and select neutral. Lower the forks as required to enable the use of suitable lifting equipment to move the forks.

3 Stop the engine. Remove the key.

4 Release locking pins **A** and slide the forks to the desired position using suitable lifting equipment. ⇨ *Fig 46. (🗋 66)*

Note: *Your machine will have either twist and pull or pull type fork locking pins.* ⇨ *Fig 46. (🗋 66)*



T069200-7

Fig 46.

⚠ WARNING

If the fork/locking pin is not fully engaged, the fork could become unintentionally disengeged.

12-6-1-13

5 Remove the lifting equipment and make sure the forks are correctly located. Re-engage locking pins **A** and make sure the pins are correctly located.

Bar Carriage Fork Adjustment

1 Park the machine on solid level ground.

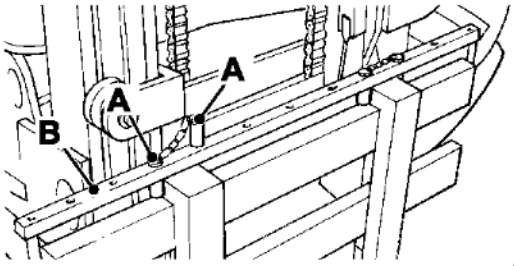
2 Make sure the park brake is engaged and select neutral. Lower the forks as required to enable the use of suitable lifting equipment to move the forks.

3 Stop the engine. Remove the starter key.

4 Remove the retaining pins **A**. ⇨ *Fig 47. (🗋 66)*

5 Using suitable lifting equipment, reposition the forks as required ensuring that each fork is positioned between two holes on the mounting bracket **B**.

6 Refit the two pairs of retaining pins **A**, using one pair for each fork. Make sure that each pin drops freely into place and that each pair of pins is positioned as shown.



113070-C2

Fig 47.

7 Remove the lifting equipment and make sure the forks are correctly located.

Handling Palleted Loads

⚠ WARNING

Make sure you know the weight of the load before lifting it. Do not exceed the SWL of the machine with the carriage/attachment you are using.

9-2-3-1

⚠ 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

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

0002

⚠ CAUTION

One-Fork Lifting

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

5-1-4-3

⚠ CAUTION

Fork Spacing

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

Use the mast tilt to aid load pick-up and placing, and to compensate for small variations in gradient.

Loading

1 Space the forks as wide as possible to suit the load. ⇨ *Repositioning the Forks (🗋 66)*.

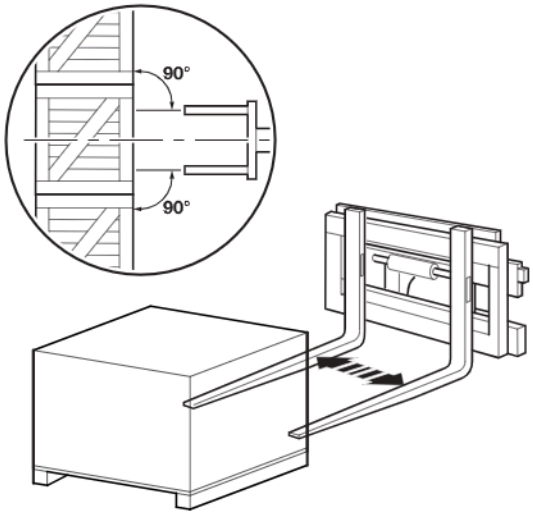


Fig 48.

2 Put the forks in the horizontal position.

3 Approach the load straight-on, not at an angle, with all wheels straight. Stop the machine with the forks just in front of the load. Engage the park brake. Put the transmission in neutral.

⚠ CAUTION

An unsound pallet can break and spill the load. Make sure that the pallet is in good condition before lifting it.

9-2-3-2

4 Select first gear, release the park brake and carefully drive forward to insert the forks cleanly under the pallet. Stop when the fork uprights just touch the load. Engage the park brake. Put the transmission in neutral.

⚠ 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 mast back just enough to stabilise the load.

6 Check that it is clear behind you, then slowly reverse the machine away in first gear.

7 Stop the machine. Engage the park brake. Put the transmission in neutral. Put the mast and carriage into the travel position.

8 Carefully drive the machine to the unloading point.

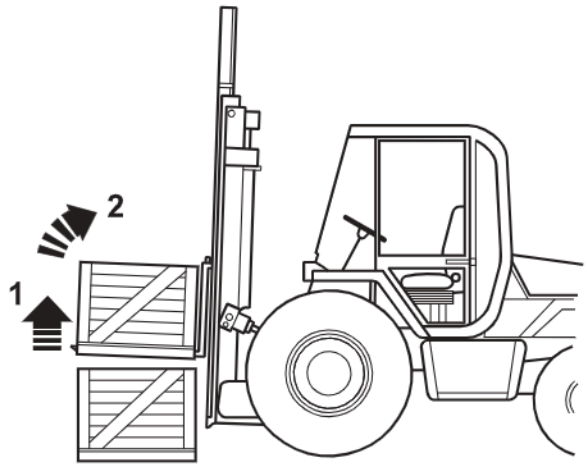


Fig 49.

Unloading on the Ground

⚠ CAUTION

Unloading

Never unload the forks by stopping the machine suddenly. Follow the procedures in the Operator Manual for unloading.

5-1-4-4_2

1 Approach the unload area on centre, with the rear wheels straight. Stop the machine with the load directly over the unload point.

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

3 Set the forks level with the ground and lower the load into position.

4 Lower the forks a little more to clear the pallet. Tilting the mast forward a little may help at this stage.

5 Check that it is clear behind you, then slowly reverse the machine away in first gear.

6 When the forks are clear of the load, stop the machine. Engage the park brake and put the transmission in neutral.

7 Put the mast and carriage into the site travel position.

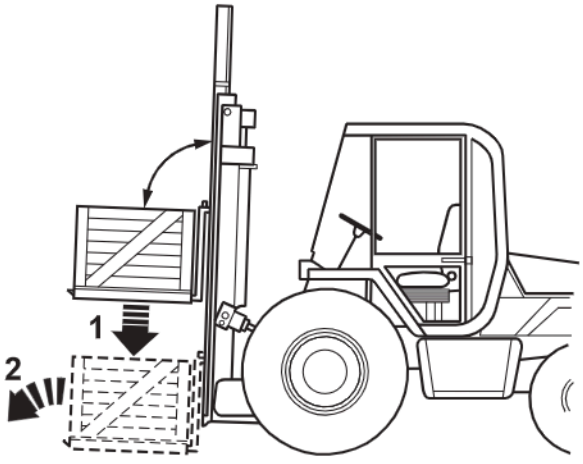


Fig 50.

Unloading Above Ground Level

Unload above ground level only after you fully understand how to handle palleted loads. The basic procedure is the same, but remember the following points:

⇨ *Stacking Loads (🗋 72)*.

1 Approach the unload area on centre, with the rear wheels straight. Stop the machine, just in front of the stack (or platform).

2 Raise the load until it is a few inches higher than the stack or platform.

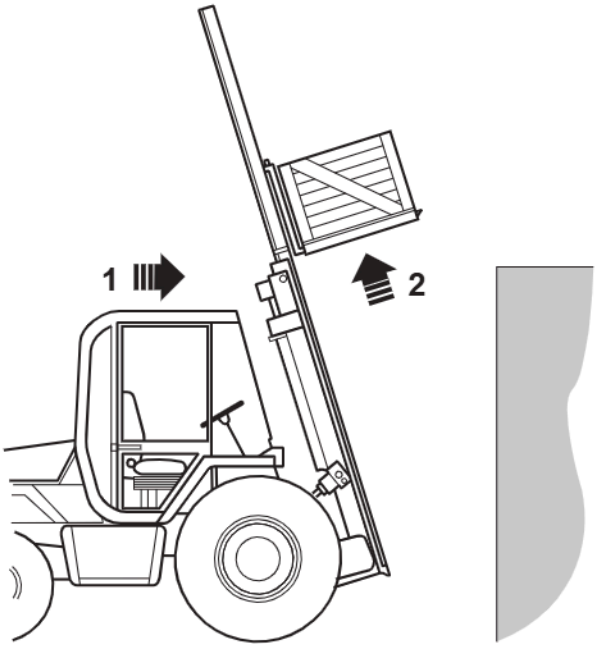


Fig 51.

3 Drive forward in first gear until the load is directly above its required position. Stop the machine. Engage the park brake. Put the transmission in neutral.

4 Set the forks level with the unload area and lower the load into position.

5 Lower the forks a little more to clear the pallet. Tilting the mast forward a little may help at this stage.

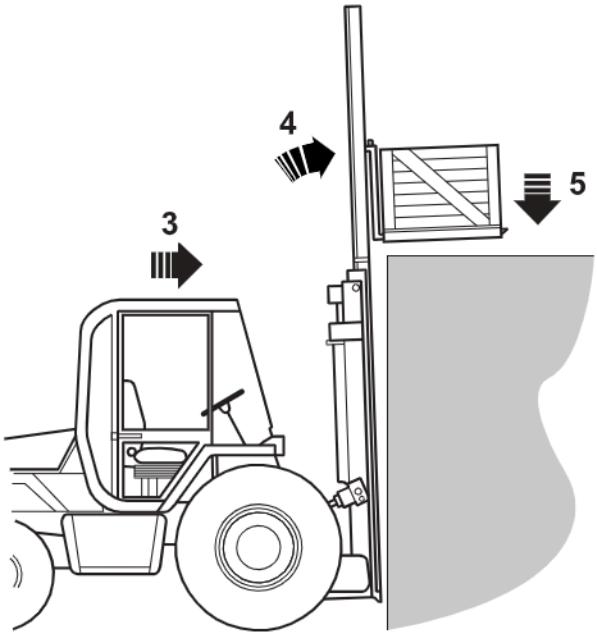


Fig 52.

6 Check that it is clear behind you, then slowly reverse the machine away in first gear.

7 When the forks are clear of the load, stop the machine. Engage the park brake and put the transmission in neutral.

8 Lower the forks. Put the mast and carriage into the site travel position.

Handling 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 forks and tilt them forward as shown.

2 Carefully drive the machine forward in first gear (**1**). Stop when the fork uprights just touch the load. Tilt the mast back. Put the mast and carriage in the travel position.

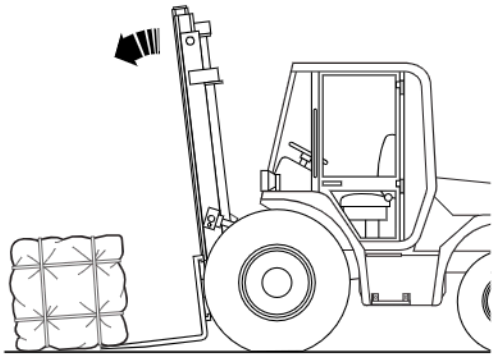


Fig 53.

Handling Drums

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

⚠ WARNING

The machine's load centre is extended when using a drum clamp attachment. Do not overload the machine.

5-2-4-11

Use a drum clamp attachment when handling drums.

1 Fit the Drum Clamp Attachment

a Space the forks to correct width.

b Set the carriage vertical.

c Mount the drum clamp on the forks and lock it in position with screw **A**.

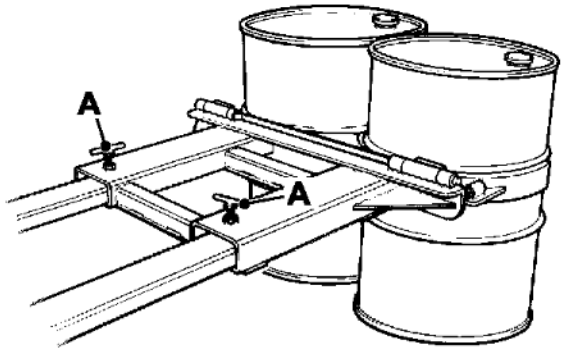


Fig 54.

2 Pick Up the Drums

a Make sure that the clamp is upright.

b Approach the drums on centre.

c Position the clamp arms just below the level of the rims.

d Drive the machine forward or extend the carriage until the drums seat securely in the clamp.

Note: *The clamp arms will open when contact is made with the drums and close when the drums seat securely in the clamp*

e Raise the carriage slightly to take the weight of the load. Then put the mast and carriage into the travel position.

3 Place the Drums

a At the unloading point, position the carriage so that the drums are above their required position. Slowly lower the carriage until the drums touch the ground.

b Slowly withdraw the carriage away from the drums; the clamp will automatically open.

c Return the mast and carriage to the travel position.

Handling Irregular Loads

Handle irregular loads only after you fully understand how to handle palleted loads. The basic procedure is the same as for palleted loads, but note the following points:

1 Know the load weight and load centre before lifting it.

2 Do not exceed the machine loading limits.

3 Approach the load on centre. Stop the machine, leaving enough room to manoeuvre the mast and carriage.

4 Operate the mast and carriage controls only when the machine is stopped, with the park brake engaged and the transmission in neutral.

Stacking Loads

T2-070

Box Pallets

Stack box pallets straight and square. For extra stability, stagger the top row.

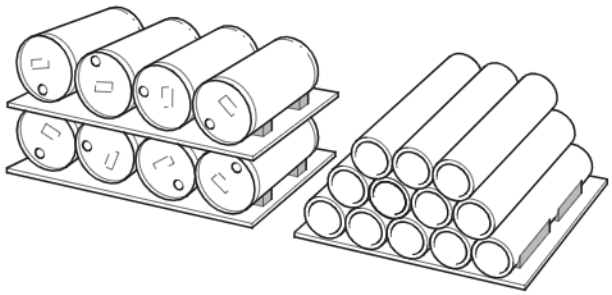


151990-3

Fig 55.

Cylindrical Loads

Stack cylindrical loads tightly together and level. Wedge both ends of each row. If building a pyramid stack, wedge both ends of the bottom row.



151990-4

Fig 56.

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 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.

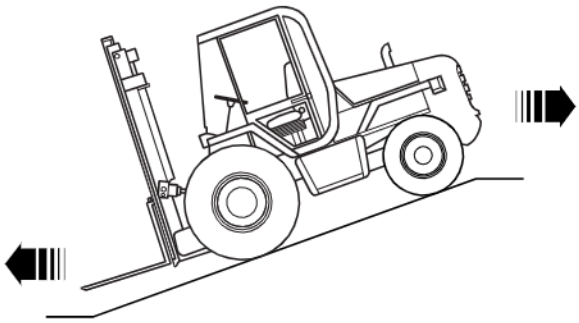


Fig 57.

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

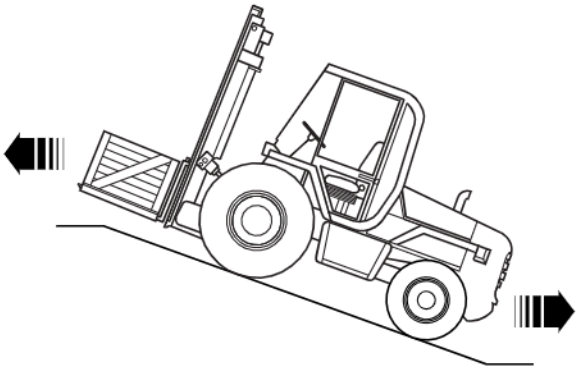


Fig 58.

Driving Across Gradients

Read and understand the instructions in this manual 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, 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 100-150mm (4-6in) above the ground, with a load which is carried on top of the forks, as shown at **A**. ⇨ *Fig 59. (🗋 74)*. 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.

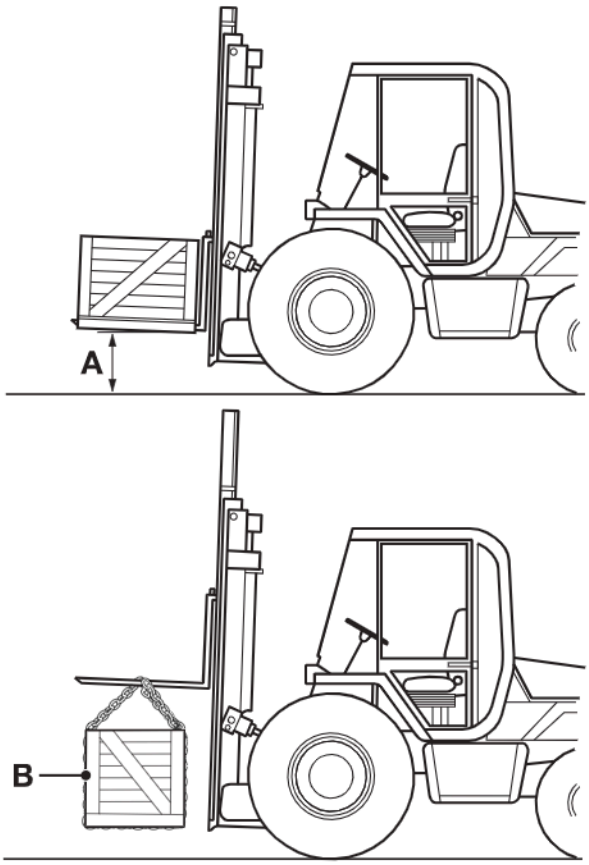


Fig 59.

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 manual.

0019

Longitudinal and lateral stability are two important safety factors that must be considered if the carriage is to be raised by more than 100-150mm (4-6in) above the ground with the machine on a gradient.

Important: *Lifting operations should not be undertaken on gradients unless the machine is level across its width (i.e. laterally level).*

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).

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

⚠ WARNING

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

0020

Operating Environment

Operating in Low Temperatures

T3-069_3

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

1 Use the correct viscosity engine lubricating oil.

2 Use the correct viscosity hydraulic oil.

3 If available use a low temperature diesel fuel.

4 Use the correct coolant mixture.

5 Keep the battery at full charge.

6 Fill the fuel tank at the end of each work period. This will help to prevent condensation forming on the tank walls.

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

8 Install a cold weather starting aid. In very low temperatures, -18°C (0°F) and below, additional starting aids may be needed. Examples are fuel, oil and coolant heaters. Ask your JCB distributor for advice.

Important: *Do not connect two batteries in series to give 24 volts for starting as this can cause damage to the electrical circuits.*

9 Remove snow from the engine compartment before starting otherwise snow could get into the air filter.

Operating in High Temperatures

T3-070

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

1 Use the correct viscosity engine lubricating oil.

2 Use the correct coolant mixture.

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

4 Keep the radiator/oil cooler clean, regularly remove dirt and debris from the radiator/oil cooler and the engine.

5 Check the fan belt regularly.

6 Check the air vents. Make sure that the air vents to and from the engine compartment are not blocked.

7 Check the engine pre-cleaner regularly (if fitted).

8 Check the battery electrolyte level.

Refuelling a Machine

Low Fuel Levels

If you operate the machine on very low fuel levels, then air can enter the fuel system. To prevent the entry of air, always add more fuel when the fuel gauge shows a low level of fuel.

If air enters the fuel system, the engine speed will vary dramatically and low power will be experienced. The symptoms may be made worse when the machine operates on steep gradients.

Note: *If you Increase the engine speed or load while there is air in the fuel system, then subsequent damage to the engine can occur.*

If the fuel supply contains air, you must stop the engine, fill the fuel tank then bleed the fuel system to remove the air. Refer to ***Routine Maintenance, Fuel System***.

Important: *You must bleed the fuel system after a fuel filter change.*

Filling the Tank

Important: *Before you add fuel to the machine, refer to* ***Fluids Lubricants and Capacities, Fuels****. If you use the incorrect type of fuel, or fuel which is contaminated, then damage to the fuel injection system can occur.*

⚠ CAUTION

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

GEN-9-2

⚠ WARNING

Fuel

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

INT-3-2-2_3

⚠ CAUTION

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

Do not use fuel to clean the machine.

When filling with fuel, choose a well aired and ventilated area.

INT-2-2-12

⚠ WARNING

Mobile Phones

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

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

INT-3-3-9

⚠ 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

At the end of every working day, fill the tank with the correct type of fuel. This will prevent overnight condensation from developing in the fuel.

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

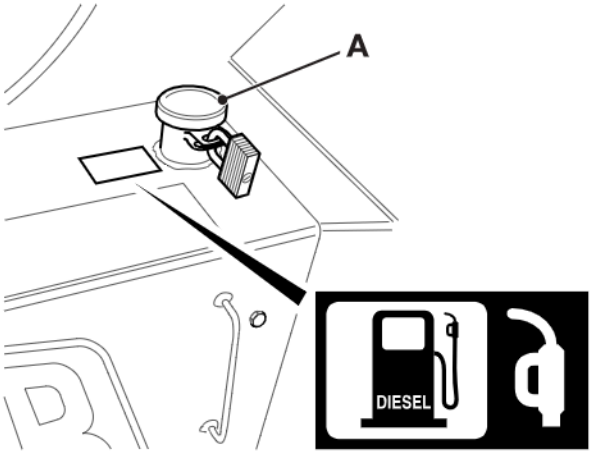


Fig 60.

Moving a Disabled Machine

Towing and Retrieval

Do not tow a machine unless there is no alternative. Remember that further damage might be caused to the machine by towing it. If at all possible repair the machine where it stands. If the machine must be towed read the following ***CAUTIONS*** and ***WARNINGS*** and use the procedure given here.

⚠ 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 15 mph (25 km/h).

Use a rigid draw-bar. If a towing chain must be used, 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.

2-2-7-3-2

1 Engage the park brake.

2 Set the gear lever to neutral.

3 Set the Two/Four Wheel Drive to 2WD.

4 Prepare the machine for travel. See ***Preparing for Road Travel***.

If the engine cannot be run, the mast 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.

5 Attach the drawbar to a suitable location.

6 The machine is now ready for towing. Make sure you understand what the towing driver will be doing. Obey his instructions and all relevant regulations.

Also note that if the engine cannot be started, the effort required to steer the machine is greatly increased.

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

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

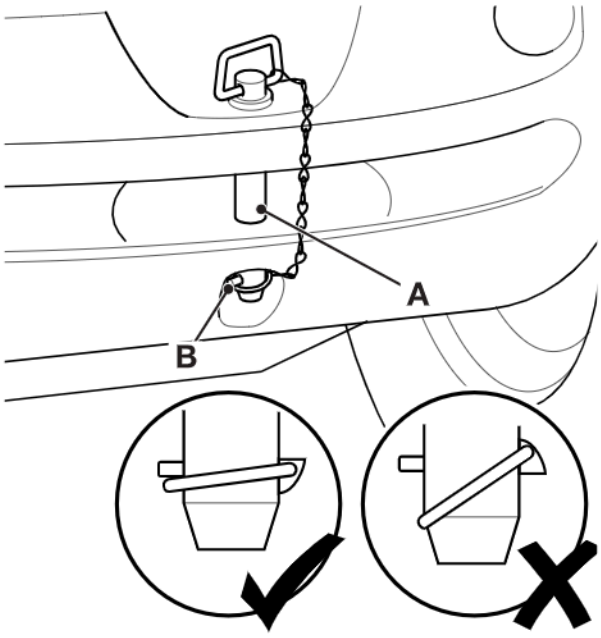


Fig 61.

Transporting the Machine

Loading a Machine on to a transporter

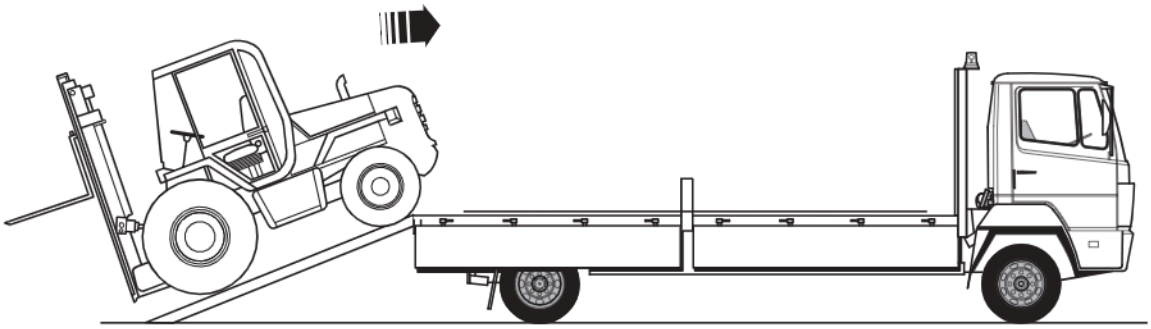


Fig 62.

⚠ WARNING

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

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. Take particular note of laws etc. which affect total load height and trailer weight.*

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 Static Dimensions in SPECIFICATION section for the minimum ground clearance of your machine.

2-2-7-5_1

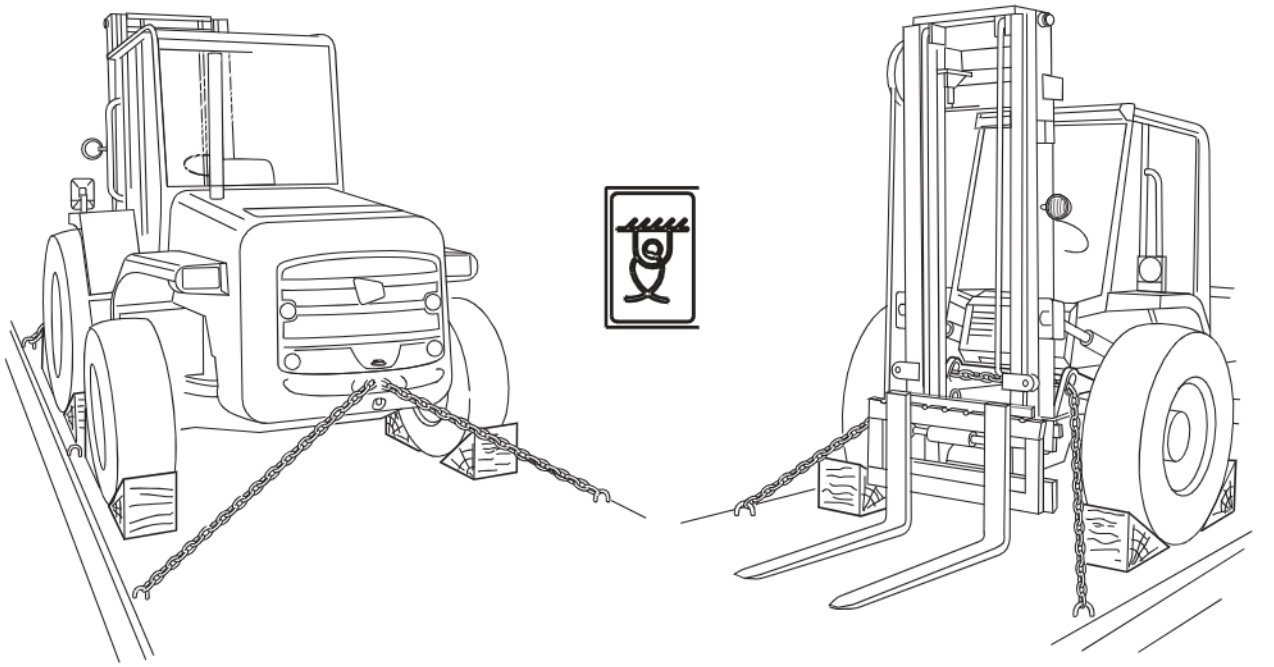
1 Place blocks at the front and rear of the trailer wheels.

2 Move the Machine onto the Trailer

- **a** Make sure the ramps are correctly in place and secure.
- **b** Set the carriage central. Tilt the mast fully back. Raise the carriage far enough so that the forks will not foul on the ramps as you approach them.
- **c** Carefully reverse the machine onto the trailer. ⇨ *Fig 62. (79)*.
- **d** When the machine is safely in position, engage the park brake and put the transmission in neutral.
- **e** Set the mast vertical. Lower the forks onto the trailer.
- **f** Check that the overall height of the load is within regulations. Adjust if necessary.
- **g** Switch off the engine.
- **h** Secure the cab.
- **i** Cover the exhaust stack.

3 Put blocks at the front and rear of all four tyres. Anchor the machine to the trailer with chains. The anchor points are shown on the illustration.

4 Measure the maximum height of the machine from the ground. Make sure that the transporter driver knows the clearance height before he drives away.



298261-2

Fig 63.

Putting the Mast into the Transport Position

With the machine safely in position on the trailer, the park brake engaged and the transmission in neutral, do the following:

1 Unfasten both tilt cylinder restraint wires from the mast.

   a Unscrew and remove bolt **A** and washer **B** from each mast tilt cylinder pivot pin.

   b Remove the restraint wires **C** (if fitted).

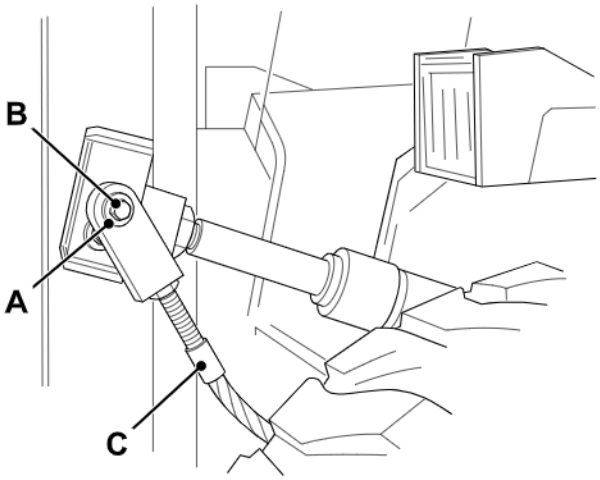


Fig 64.

2 With the engine running, operate the controls to raise the carriage 200mm (8 in) from it's lowest position.

3 Tilt the mast fully forward. Make sure the forks do not foul on the trailer bed. ⇨ *Fig 65. (81)*.

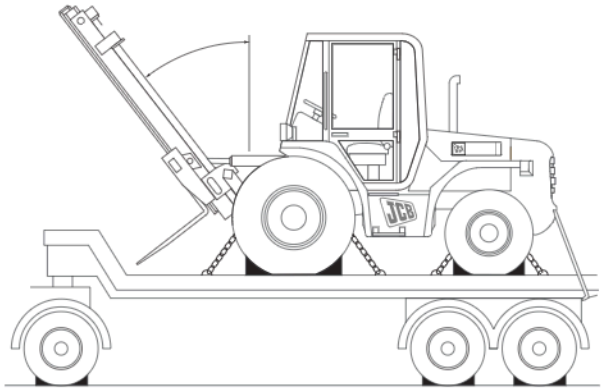


Fig 65.

Unloading a Machine from the Transporting Vehicle

1 Position the transporting vehicle on firm level ground.

2 Apply the park brakes and lower any stability jacks.

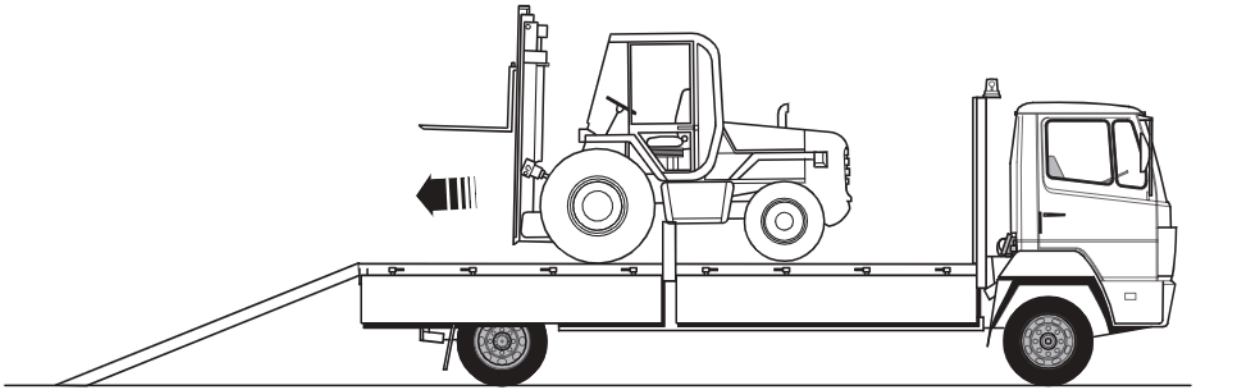
3 Position the loading ramps securely on the transporter.

Note: *Ramps should be level with each other in the lowered position.*

4 Remove the securing straps from the machine and stow them.

5 Start the machine, tilt the mast back and raise the forks. Raise the carriage far enough so that the forks do not foul on the ramps when you drive off. ⇨ *Fig 66. (82)*.

6 Carefully drive the machine slowly off the ramps and transporter.



800990-2

Fig 66.

Taking the Mast Out of the Transport Position

The mast must be returned to the normal position before driving the RTFL off the transporter.

⚠ WARNING

Mast Tilt

The machine is equiped with special laydown tilt cylinders. The FULL tilt feature is to be used for TRANSPORTING on trucks or trailer only and not on the work site. Both tilt cylinder restraint wires MUST be secured at both ends while the machine is being used on the work site.

9-1-3-5

1 Make sure the park brake engaged.

2 Start the engine.

3 Tilt the mast fully back.

4 Lower the forks and stop the engine. Remove the starter key.

5 Fasten both tilt cylinder restraint wires to the mast.

a Install each restraint wire **C** (if fitted) to its mast and tilt cylinder pivot pin.

b Install washer **B** and bolt **A**.

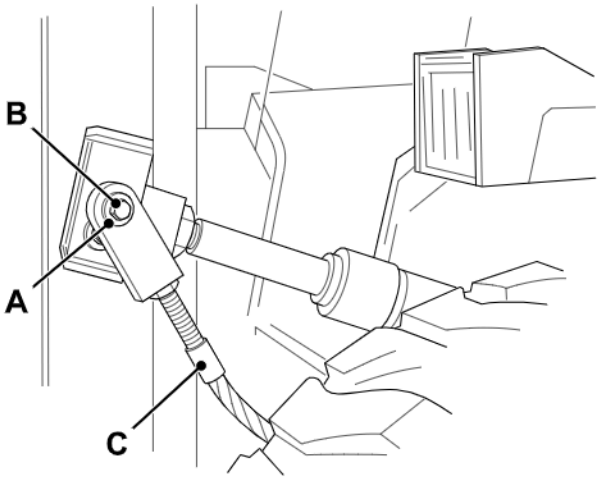


Fig 67.

Lifting a Machine

Carry out the following procedure when lifting a machine:

1 Remove all attachments.

2 Make the machine safe with the mast lowered. Refer to ***How to Make the Machine Safe (Mast Lowered)***.

3 Remove the rear fenders (if fitted, contact your local JCB dealer) and all loose equipment from the machine exterior.

4 Check the unladen weight of the machine. Refer to See ***Static Dimensions*** (SPECIFICATIONS section).

⚠ WARNING

Lifting Equipment

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

INT-1-3-7_2

5 Attach lifting equipment to lifting points as shown.

Note: *Look for instructional label* ***A*** *to identify the correct lifting points.*

6 Take the weight of the machine. If the lifting equipment is fouling on the machine use spreader bars to prevent damage.

7 Check that the lifting eye is positioned directly above the machine centre of gravity.

⚠ DANGER

Do not stand underneath the raised load during the lowering procedure. 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.

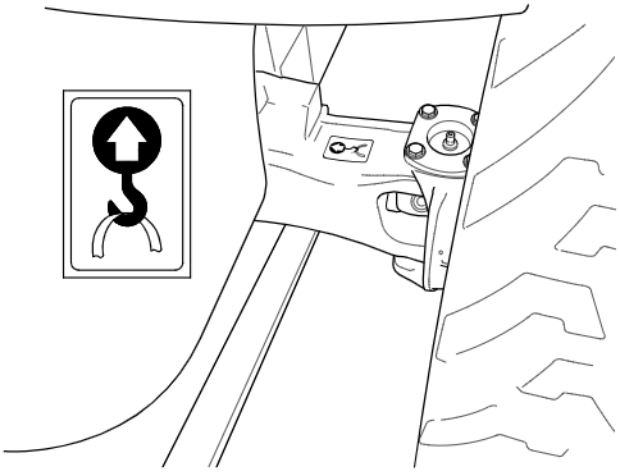
2-3-5-3

⚠ WARNING

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



T047530-1

Fig 68.

Storage of the Machine

Introduction

T2-074

If you will not use the machine for an extended period, you must store the machine correctly. If you prepare the machine carefully and apply on-going care you can prevent deterioration and damage to the machine while it is in storage.

Note: *JCB Dealers must check stock monthly.*

Storage Area

The machine can be stored in a temperature range of:

-40°C to 54°C (-40°F to 129°F).

When possible, you must keep the machine in a dry building or shelter.

If only an outdoor storage area is available, look for a storage area with good drainage.

If the machine is to be out of use for an extended period, careful preparation and on-going care will minimise the possibility of deterioration and damage while in storage.

Prepare the Machine for Storage

T2-076

1 Clean the machine to remove all unwanted material and corrosive products.

   Dry the machine to remove solvents and moisture.

2 Apply grease to the moving parts. Refer to ***Greasing the Machine***.

3 Examine the machine for worn or damaged parts. Replace if necessary.

4 Fill the fuel tank to prevent a build up of condensation in the tank.

5 Examine the coolant condition. Replace if necessary.

6 Examine all fluid levels. Top up if necessary.

Put the Machine into Storage

T2-077

1 Park the machine on level, solid ground.

   Park the machine in a position where the machine is easy to get access (in case the machine does not start at the end of the storage period).

   Place suitable timbers under the machine to eliminate direct contact with the ground.

2 Retract all rams and lower the attachments to the ground.

3 Vent the hydraulic system.

4 Remove the starter key.

5 Apply a thin layer of grease or petroleum jelly to all exposed ram piston rods.

6 Remove the battery. Charge the battery.

   Keep the battery in warm, dry conditions. Charge the battery periodically.

7 If you keep the machine outdoors, cover the machine with tarpaulins or plastic sheets.

During Storage

T2-078

Operate the machine functions each week to prevent a build up of rust in the engine and hydraulic circuits, and to minimise deterioration of the hydraulic seals.

1 Clean the machine to remove all unwanted material and corrosives.

   Remove the grease or petroleum jelly from the ram piston rods.

2 Install a charged battery.

3 Examine all fluid levels. Top up if necessary.

4 Start the engine.

5 Operate the hydraulic controls.

Make sure that the hydraulic functions operate correctly.

6 Prepare the machine for storage. Refer to ***Put the Machine into Storage***.

Take the Machine Out of Storage

T2-079

1 Examine the coolant condition. Replace If necessary

2 Examine all fluid levels. Top up if necessary.

3 Clean the machine to remove unwanted material and corrosives.

Remove the grease or petroleum jelly from the ram piston rods.

4 Install a charged battery.

5 Start the engine.

6 Operate the hydraulic controls.

Make sure that the hydraulic functions operate correctly.

Routine Maintenance

Service Requirements

Introduction

T3-095

Your machine has been designed and built to give maximum performance, economy and ease of use under a wide variety of operating conditions. Prior to delivery, your machine was inspected both at the Factory and by your Distributor to ensure that it reaches you in optimum condition. To maintain this condition and ensure trouble free operation it is important that the routine services, as specified in this Manual, are carried out by an approved JCB Distributor at the recommended intervals.

This section of the Manual gives full details of the service requirements necessary to maintain your JCB machine at peak efficiency.

A Service Manual for your machine is available from your JCB Distributor. The Service Manual contains information on how to repair, dismantle and assemble your machine correctly.

It can be seen from the Service Schedules on the following pages that many essential service checks should only be carried out by a JCB trained specialist. Only JCB Distributor Service Engineers have been trained by JCB to carry out such specialist tasks, and only JCB Distributor Service Engineers are equipped with the necessary special tools and test equipment to perform such tasks, thoroughly, safely, accurately and efficiently.

JCB regularly updates its Distributors advising them of any product developments, changes in specifications and procedures. Therefore only a JCB Distributor is fully able to maintain and service your machine.

A Service Record Sheet or Book is provided which will enable you to plan your service requirements and keep a service history record. It should be dated, signed and stamped by your Distributor each time your machine is serviced.

Remember, if your machine has been correctly maintained, not only will it give you improved reliability but its resale value will be greatly enhanced.

Owner/Operator Support

JCB together with your Distributor wants you to be completely satisfied with your new JCB machine. If you do encounter a problem however, you should contact your Distributor's Service Department who are there to help you!

You will have been given the names of the relevant service contacts at your Distributor when the machine was installed.

To get the most from your Distributor please help them to satisfy you by:

1 Giving your name, address and telephone number.

2 Quoting your machine model and serial number.

3 Date of purchase and hours of work.

4 Nature of the problem.

Remember, only your JCB Distributor has access to the vast resources available at JCB to help support you. In addition, your Distributor is able to offer a variety of programmes covering Warranty, Fixed Price Servicing, Safety Inspections, including weight tests, covering both legal and insurance requirements.

Service/Maintenance Agreements

To help plan and spread the costs of maintaining your machine, we strongly recommend you take advantage of the many Service and Maintenance Agreements your Distributor can offer. These can be tailor made to meet your operating conditions, work schedule etc.

Please consult your JCB Distributor for details.

Initial Service and Inspection

T3-005_2

To further protect your machine's performance it is essential your JCB Distributor carries out an initial service and inspection when the machine is one month old or when it has completed 100 hours of operation (whichever

occurs first). You should notify your Distributor in advance to allow the necessary arrangements to be made.

Fit for Purpose Tests for Lifting Equipment

T3-097

All lifting equipment (for example forks, lifting hooks and shackles) 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 legislation and for insurance purposes.

Check with your local JCB distributor for further advice.

Obtaining Replacement Parts

T3-096

If you use non-genuine JCB parts or consumables, then you can compromise the health and safety of the operator and cause machine failure

A Parts Book for your machine is available from your JCB Distributor. The Parts Book will help you identify parts and order them from your JCB distributor.

Your dealer will need to know the exact model, build and serial number of your machine. See ***Identifying Your Machine (Introduction section)***.

The data plate also shows the serial numbers of the engine, transmission and axle(s), where applicable. But remember if any of these units have been changed, the serial number on the data plate may be wrong. Check on the unit itself.

Health and Safety

Lubricants

T3-060_3

Introduction

It is most important that you read and understand this information and the publications referred to. Make sure all your colleagues who are concerned with lubricants read it too.

Hygiene

JCB lubricants are not a health risk when used properly for their intended purposes.

However, excessive or prolonged skin contact can remove the natural fats from your skin, causing dryness and irritation.

Low viscosity oils are more likely to do this, so take special care when handling used oils, which might be diluted with fuel contamination.

Whenever you are handling oil products you should maintain good standards of care and personal and plant hygiene. For details of these precautions we advise you to read the relevant publications issued by your local health authority, plus the following.

Storage

Always keep lubricants out of the reach of children.

Never store lubricants in open or unlabelled containers.

Waste Disposal

⚠ CAUTION

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

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

INT-3-2-14

All waste products should be disposed of in accordance with all the relevant regulations.

The collection and disposal of used oil should be in accordance with any local regulations. Never pour used engine oil into sewers, drains or on the ground.

Handling

⚠ 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

New Oil

There are no special precautions needed for the handling or use of new oil, beside the normal care and hygiene practices.

Used Oil

Used engine crankcase lubricants contain harmful contaminants.

Here are precautions to protect your health when handling used engine oil:

1 Avoid prolonged, excessive or repeated skin contact with used oil.

2 Apply a barrier cream to the skin before handling used oil. Note the following when removing engine oil from skin:

- **a** Wash your skin thoroughly with soap and water.
- **b** Using a nail brush will help.
- **c** Use special hand cleansers to help clean dirty hands.
- **d** Never use petrol, diesel fuel, or paraffin for washing.

3 Avoid skin contact with oil soaked clothing.

4 Don't keep oily rags in pockets.

5 Wash dirty clothing before re-use.

6 Throw away oil-soaked shoes.

First Aid - Oil

Eyes

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

Swallowing

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

Skin

In the case of excessive skin contact, wash with soap and water.

Spillage

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

Fires

⚠ WARNING

Do not use water to put out an oil fire. This will only spread it because oil floats on water.

Extinguish oil and lubricant fires with carbon dioxide, dry chemical or foam. Fire fighters should use self contained breathing apparatus.

7-3-1-3_1

Battery

T3-061

⚠ WARNING

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

Battery electrolyte contains sulphuric acid. It can burn you if it touches your skin or eyes. Wear goggles. Handle the battery carefully to prevent spillage. Keep metallic items (watches, rings, zips etc) away from the battery terminals. Such items could short the terminals and burn you.

Set all switches to OFF before disconnecting and connecting the battery. When disconnecting the battery, take off the earth (-) lead first.

Re-charge the battery away from the machine, in a well ventilated area. Switch the charging circuit off before connecting or disconnecting the battery. When you have installed the battery in the machine, wait five minutes before connecting it up.

When reconnecting, fit the positive (+) lead first.

5-3-4-12

⚠ CAUTION

Do not disconnect the battery while the engine is running, otherwise the electrical circuits may be damaged.

INT-3-1-14

⚠ WARNING

Electrical Circuits

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

INT-3-1-4

⚠ DANGER

Electrolyte

Battery electrolyte is toxic and corrosive. Do not breathe the gases given off by the battery. Keep the electrolyte away from your clothes, skin, mouth and eyes. Wear safety glasses.

INT-3-2-1_3

⚠ CAUTION

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

INT-3-1-12

⚠ WARNING

Battery Gases

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

INT-3-1-8

Warning Symbols

The following warning symbols may be found on the battery.

Symbol	Meaning
 A289230-1	Keep away from children.
 A289260-1	Shield eyes.
 A289280	No smoking, no naked flames, no sparks.
 A289250	Explosive Gas.
 A289240	Battery acid.
 A289270	Note operating instructions.

First Aid - Electrolyte

Do the following if electrolyte:

Gets into your eyes

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

Is swallowed

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

Gets onto your skin

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

Service Schedules

Introduction

T3-036_3

⚠ WARNING

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

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

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

8-3-1-1

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

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. When there is no hourmeter fitted, use the calendar equivalents to determine the service intervals. Refer to ***Calendar Equivalents***. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

How to Use the Service Schedules

T3-012_4

In the example shown, **A** shows all service requirements to be carried out every 10 hours and **B** shows the requirements to be carried out every 500 hours.

Important: *Services should be carried out at either the hourly interval or calendar interval, whichever occurs first. Refer to* ***Calendar Equivalents****.*

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

Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	A: 10	50	100[1]	B: 500	1000	2000	8000
ENGINE								
Coolant Quality and Level	- Check	□	□	□	□	□		
Cooling System	- Drain and Refill						□	□
Oil level	- Check	□	□					
Oil and Filter[2][3][4]	- Change				□	□	□	□
Air Cleaner Dust Valve[3]	- Change				□	□	□	□
Air Cleaner Outer Element[3]	- Change					□	□	□
Air Cleaner Inner Element	- Change						□	□
Pre-Cleaner (if fitted)	- Check			□				
Water Seperator	- Check for contamination and Drain		□	□	□	□	□	□
Engine Fuel Filter	- Change					□	□	□
Front End Accessory Drive (FEAD) Belt Condition	- Check				□	□	□	□
Front End Accessory Drive (FEAD) Belt	- Change							□
Engine Mounting Bolts for Tightness	- Check			□	□	□	□	□
All Hoses - Condition	- Check			□	□	□	□	□
Radiator[5]	- Clean				□	□	□	□
Crankcase Ventilation Filter	- Change					□	□	□

795390-1

Calendar Equivalents

T3-051

Every 10 Hours = Daily

Every 50 Hours = Weekly

Every 500 Hours = Six Months

Every 1000 Hours = Yearly

Every 2000 Hours = 2 Years

Every 6000 Hours = 6 Years

Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	10	50	(1)100	500	1000	2000	6000
ENGINE								
Coolant Quality and Level	- Check	☐	☐	☐	☐	☐		
Cooling System	- Drain and Refill						☐	☐
Oil level	- Check	☐	☐					
Oil and Filter(2)(3)	- Change				☐	☐	☐	☐
Air Cleaner Dust Valve(4)	- Change				☐	☐	☐	☐
Air Cleaner Outer Element(4)	- Change				☐	☐	☐	☐
Air Cleaner Inner Element(4)	- Change						☐	☐
Pre-Cleaner (if fitted)	- Check			☐				
Water Separator and Engine Fuel Filter	- Drain		☐	☐	☐	☐	☐	☐
Water Separator Fuel Filter(5)	- Change				☐	☐	☐	☐
Engine Fuel Filter	- Change					☐	☐	☐
Front End Accessory Drive (FEAD) Belt Condition	- Check				☐	☐	☐	☐
Front End Accessory Drive (FEAD) Belt	- Change							☐
Engine Mounting Bolts for Tightness	- Check			☐	☐	☐	☐	☐
All Hoses - Condition	- Check			☐	☐	☐	☐	☐
Radiator(4)	- Clean				☐	☐	☐	☐
Breather Gauze	- Clean						☐	☐
Valve Clearances(6)	- Check and Adjust						☐	☐
Oil Filler and Dipstick Seals(6)	- Check and Adjust						☐	☐
Rocker Cover and Injector Seals(6)	- Change						☐	☐
Injectors(6)	- Change							☐
Injector(s) Leak Off Rail(6)	- Change							☐
High Pressure Fuel Lines(6)	- Inspect							☐
TRANSMISSION, AXLES AND STEERING								
Transmission Oil Level	- Check	☐	☐	☐	☐			
Transmission Oil(7)	- Change					☐	☐	☐
Transmission Filter	- Change			☐	☐	☐	☐	☐
Transmission Strainer	- Clean					☐	☐	☐
Front Axle Oil Level	- Check			☐	☐			
Front Axle Oil	- Change					☐	☐	☐
Rear Axle Differential Oil Level (4WD)	- Check			☐	☐			
Rear Axle Differential Oil (4WD)	- Change					☐	☐	☐
Rear Axle Hub Oil Level (4WD)	- Check			☐	☐			
Rear Axle Hub Oil (4WD)	- Change					☐	☐	☐

	Operation	10	50	(1)100	500	1000	2000	6000
Tyre Pressures/Condition	- Check	☐	☐	☐	☐	☐	☐	☐
Tightness of Wheel Nuts(8)	- Check	☐	☐	☐	☐	☐	☐	☐
Rear Hub Bearings (2WD)	- Grease	☐	☐	☐	☐	☐	☐	☐
Rear Hub Bearings (2WD)(6)	- Check			☐	☐	☐	☐	☐
Steer Axle Movement/Shimming(6)	- Check			☐	☐	☐	☐	☐
Steering Pivots and Track Rods	- Check			☐	☐	☐	☐	☐
Steer Axle Pivots and Linkages	- Grease	☐	☐	☐	☐	☐	☐	☐
Track Rod Ends	-Grease	☐	☐	☐	☐	☐	☐	☐
Propeller Shafts, Drive Shafts and Universal Joints	- Security/Grease	☐	☐	☐	☐	☐	☐	☐
Wheel Alignment	- Check				☐	☐	☐	☐
HYDRAULICS								
System for Leaks	- Check	☐	☐	☐	☐	☐	☐	☐
Oil Level	- Check	☐	☐	☐	☐	☐		
Oil(6)	- Change and Clean Strainer						☐	☐
Oil Filter	- Change			☐	☐	☐	☐	☐
Hoses - Damage or Leaks	- Check				☐	☐	☐	☐
Pipework - Damage or Leaks	- Check		☐	☐	☐	☐	☐	☐
Rams - External Leaks	- Check		☐		☐	☐	☐	☐
Rams - Chrome Condition	- Check		☐		☐	☐	☐	☐
Hydraulic Oil, Top End of Mast Lift Ram	- Top -up		☐	☐	☐	☐	☐	☐
BRAKES								
Brake System Fluid Level	- Check	☐	☐	☐	☐	☐		
Brake System Fluid(6)	- Change						☐	☐
Park Brake	- Check and Adjust	☐	☐	☐	☐	☐	☐	☐
ELECTRICS								
Battery Electrolyte Level	- Check			☐	☐	☐	☐	☐
Wiring for Chafing/Routing	- Check		☐	☐	☐	☐	☐	☐
Battery Charge Condition	- Check			☐	☐	☐	☐	☐
Battery Terminals for Condition and Tightness			☐	☐	☐	☐	☐	☐
BODYWORK AND CAB								
Pivot Pins and Bushes	- Check and Grease	☐	☐	☐	☐	☐	☐	☐

	Operation	10	50	(1)100	500	1000	2000	6000
Mast Tilt Rams	- Grease	☐	☐	☐	☐	☐	☐	☐
Mast Lift Ram	- Grease	☐	☐	☐	☐	☐	☐	☐
Mast Chains	- Grease			☐	☐	☐	☐	☐
Mast Chains Adjustment(6)	- Check			☐	☐	☐	☐	☐
Mast Chains(6)	- Check for Wear and Stretch			☐	☐	☐	☐	☐
Mast and Carriage Rollers(6)	- Check		☐	☐	☐	☐	☐	☐
Mast Pulleys	- Check		☐	☐	☐	☐	☐	☐
Mast Roller Guides(6)	- Check			☐	☐	☐	☐	☐
Mast Sections	- Check			☐	☐	☐	☐	☐
Forks - Condition and Heel Thickness	- Check			☐	☐	☐	☐	☐
All Hinges	- Lubricate		☐	☐	☐	☐	☐	☐
All Cables	- Lubricate		☐	☐	☐	☐	☐	☐
All Linkage Points	- Lubricate		☐	☐	☐	☐	☐	☐
Roof and Screen Guards	- Check				☐	☐	☐	☐
FOPS Structure	- Check	☐	☐	☐	☐	☐	☐	☐
Windscreen Washer Fluid Level	- Check	☐	☐	☐	☐	☐	☐	☐
Condition of Paintwork	- Check			☐	☐	☐	☐	☐
Seat Belt Condition and Security (If fitted)	- Check	☐	☐	☐	☐	☐	☐	☐
Machine Generally	- Check for Damage and Clean	☐	☐	☐	☐	☐	☐	☐
ATTACHMENTS								
Optional Attachments as needed - see manufacturer's instructions	- Check			☐	☐	☐	☐	☐
For Fit and Security	- Check		☐	☐				

(1) First 100 Hours Service only, to be completed by your JCB Distributor.
(2) If operating under arduous conditions, change the engine oil and filter every 250 hours.
(3) The oil service interval will be affected if there is a high sulphur content in the fuel. Refer to Fuel System for more information.
(4) More frequently if operating in dusty working environments.
(5) If the engine is difficult to start or the engine has poor performance, fit new filters.
(6) Jobs which should only be done by a specialist.
(7) After a major transmission repair, the new oil should be run to operating temperature and changed again to remove any contamination which entered during the repair. Change the oil and filter after a further 100 hours if the oil was heavily contaminated because of, or from the failure (e.g. water contamination).
(8) Check tightness of the wheel nuts every day for first week (when machine is new), thereafter every 50 hours.

Functional Test and Final Inspection

	Operation	10	50	100(1)	500	1000	2000	6000
ENGINE								
Idle Speed(2)	- Check and Adjust			☐	☐	☐	☐	☐
Torque Converter Stall Speed(2)	- Check			☐	☐	☐	☐	☐
Max. No-Load Speed(2)	- Check and Adjust			☐	☐	☐	☐	☐
Exhaust Smoke	- Check		☐	☐	☐	☐	☐	☐
Exhaust System Security(2)	- Check			☐	☐	☐	☐	☐
Air Inlet System Security	- Check			☐	☐	☐	☐	☐
Throttle System and Control Cable(2)	- Check			☐	☐	☐	☐	☐
Engine for Vibration/Noise								
TRANSMISSION, AXLES AND STEERING								
Neutral Start Operation	- Check		☐	☐	☐	☐	☐	☐
2WD/4WD Selection	- Check			☐	☐	☐	☐	☐
Forward/Reverse and Gear Change - Operation	- Check			☐	☐	☐	☐	☐
Transmission Operation	- Check		☐	☐	☐	☐	☐	☐
Transmission Main Line Pressure(2)	- Check				☐	☐	☐	☐
Transmission for Leaks	- Check		☐		☐	☐	☐	☐
Clutch Disconnect	- Check			☐	☐	☐	☐	☐
Clutch Pack Pressures(2)	- Check			☐	☐	☐	☐	☐
Oil Cooler and Pipework	- Check		☐	☐	☐	☐	☐	☐
HYDRAULICS								
MRV Pressure(2)	- Check and Adjust			☐	☐	☐	☐	☐
Operation of All Services(3)	- Check	☐	☐	☐	☐	☐	☐	☐
Hose Burst Protection Valves	- Check			☐	☐	☐	☐	☐
All ARVs - Pressure(2)	- Check and Adjust			☐	☐	☐	☐	☐
Carriage Descent Flow Regulator(2)	- Check and Adjust			☐	☐	☐	☐	☐
Deration Valve Pressure(2)	- Check and Adjust			☐	☐	☐	☐	☐
Auxiliary Circuit & Pressures(2)	- Check and Adjust			☐	☐	☐	☐	☐
Steering Pressure(2)	- Check and Adjust			☐	☐	☐	☐	☐
Hose Reels	- Check			☐				
BRAKES								
Foot Brake - Operation	- Check	☐	☐	☐	☐	☐	☐	☐
Park Brake - Operation	- Check	☐	☐	☐	☐	☐	☐	☐
ELECTRICS								
Starter Motor	- Check			☐	☐	☐	☐	☐
Alternator - Output	- Check			☐	☐	☐	☐	☐
Wipers/Washers	- Check	☐	☐	☐	☐	☐	☐	☐

	Operation	10	50	100(1)	500	1000	2000	6000
Beacon - Operation (if fitted)	- Check	☐	☐	☐	☐	☐	☐	☐
Heater - Operation	- Check	☐	☐	☐	☐	☐	☐	☐
Warning Lights/Audible Alarm	- Check	☐	☐	☐	☐	☐	☐	☐
Lights and Instruments	- Check	☐	☐	☐	☐	☐	☐	☐
Operational Lights	- Check	☐	☐		☐	☐	☐	☐
Horn - Operation	- Check	☐	☐		☐	☐	☐	☐
Reverse Alarm	- Check	☐	☐		☐	☐	☐	☐
All Other Equipment (as fitted)	- Check	☐	☐	☐	☐	☐	☐	☐
BODYWORK AND CAB								
Teeth and Side Cutters (if fitted)	- Check Security			☐	☐	☐	☐	☐
Glazing for Correct Fit	- Check			☐	☐	☐	☐	☐
Doors and Hinges - Fitment/Leaks	- Check			☐	☐	☐	☐	☐
Locks and Keys	- Check			☐	☐	☐	☐	☐
ATTACHMENTS								
Attachment Operation	- Check	☐	☐	☐	☐	☐	☐	☐
Circuit Pressures	- Check			☐	☐	☐	☐	☐
LIFTING EQUIPMENT								
Fit for Purpose Test(4)	- Complete				☐	☐	☐	☐

(1) First 100 Hours Service only, to be completed by your JCB Distributor.
(2) Jobs which should only be done by a specialist.
(3) Fully raise and lower the mast daily to lubricate the cylinder bores and cylinder rods.
(4) This may be required every six months or at least annually in some countries to meet and comply with legislation and for insurance purposes.

Fluids, Lubricants and Capacities

JCB recommend that you use the JCB lubricants shown as they have been verified by JCB for use on JCB machines. However, you could use other lubricants that are equivalent to the JCB standards and quality or offer the same machine component protection.

Table 1.

ITEM	CAPACITY		FLUID/LUBRICANT	JCB PART NO	Container Size (1)
	Litres	UK Gallon			
Fuel Tank	88	19.3	Diesel Oil ⇨ *Acceptable and Unacceptable Fuels (🗋 101)*.		
Engine (Oil) (2)			**JCB Engine Oil EP 15W40** -10°C to +50°C (14°F to 122°F)	4001/1805	20 Litres
MIN.	12	2.64			
MAX.	15	3.3			
			JCB Engine Oil HP 10W30 -20°C to 40°C (-4°F to 104°F)	4001/1700	20 Litres
Engine (Coolant)	17	3.7	**JCB Antifreeze HP Coolant/Water** ⇨ *Coolant Mixtures (🗋 100)*	4006/1120	20 Litres
Transmission			**JCB Extreme Performance EP 10W** (3)	4000/2505	20 Litres
2WD	17.3	3.8			
4WD	18.3	4.0			
Front Axle	29.5 (6.5)	29.5 (6.5)	**JCB Gear Oil HP Plus**	4000/2205	20 Litres
Rear Axle (4WD)			**JCB Gear Oil HP90**	4000/0305	20 Litres
Differential	15	3.3			
Hubs (x2)	1.3	0.3			
Brake System			**JCB Hydraulic Fluid HP15** (4)	4002/0503	5 Litres
Hydraulic System	64	14(5)			
			JCB Hydraulic Fluid HP46 (Above 38 °C, 100 °F)	4002/0805	20 Litres
			JCB Hydraulic Fluid HP32 (Below 38 °C, 100 °F)	4002/1025	20 Litres
Grease Points and Fork Pivot pins	---	---	**JCB Special HP Grease**	4003/2017	400g
Mast Chains	---	---	**JCB Chain Lubricant**	4004/ 0237A	300ml

(1) For information about the different container sizes that are available (and their part numbers), contact your JCB dealer
(2) Caution - Do not use ordinary Engine Oil.
(3) Friction modified oils must not be used (e.g. Dexron ATF type).
(4) Caution - Do not use ordinary brake fluid.
(5) This is nominal tank capacity. The total hydraulic system capacity depends on the equipment being used. Fill and check with all rams closed. Watch level sight glass when filling.

Coolant Mixtures

T3-009_3

Check the strength of the coolant mixture at least once a year, preferably at the start of the cold period.

Replace the coolant mixture according to the intervals shown in the machine's Service Schedule.

⚠ WARNING

Antifreeze can be harmful. Obey the manufacturer's instructions when handling full strength or diluted antifreeze.

7-3-4-4_1

You must dilute full strength antifreeze with clean water before use. Use clean water of no more than a moderate hardness (pH value 8.5). If this cannot be obtained, use de-ionized water. For further information advice on water hardness, contact your local water authority.

The correct concentration of antifreeze protects the engine against frost damage in winter and provides year round protection against corrosion.

The protection provided by JCB High Performance Antifreeze and Inhibitor is shown below.

50% Concentration (Standard)

Protects against damage down to -40 °C (-39 °F)

60% Concentration (Extreme Conditions Only)

Protects against damage down to -56 °C (-68 °F)

Important: *Do not exceed a 60% concentration, as the freezing protection provided reduces beyond this point.*

If you use any other brand of antifreeze:

- Ensure that the antifreeze complies with International Specification ASTM D6210.
- Always read and understand the manufacturer's instructions.
- Ensure that a corrosion inhibitor is included. Serious damage to the cooling system can occur if corrosion inhibitors are not used.
- Ensure that the antifreeze is ethylene glycol based and does not use Organic Acid Technology (OAT).

Fuels

Acceptable and Unacceptable Fuels

T3-031

Important: *No warranty liability whatsoever will be accepted for failure of fuel injection equipment where the failure is attributed to the quality and grade of the fuel used.*

⚠ CAUTION

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

GEN-9-2

Table 2.

Fuel Specification	Applicable Engines	Service Requirements
EN590 Diesel fuel types - Auto/C0/C1/C2/C3/C4	All Dieselmax engines.	Obey the usual routine maintenance schedules and procedures.
BS2869 Class A2		
ASTM D975-91 Class 2, US DF1, US DF2, US DFA		
JIS K2204 (1992) Grades 1, 2, 3 and Special Grade 3		
ASTM D975-91 Class 1DA	All Dieselmax engines. ***Important:*** *Engines operated with these fuels may have a reduced service life.*	Obey the usual routine maintenance schedules and procedures. Fuel additives are recommended for use with low sulphur fuels. ⇨ ***Additives (🗋 102)***.
MIL T38219 XF63		
NATO F63		
French EN590 (RME5) with 5% maximum		
AVTURFSII, NATO F34, JP8, MIL T83133, DERD 2463, DEF STAN 91-87	All Dieselmax engines. ***Important:*** *Engines operated with these fuels may have a reduced service life.*	Obey the usual routine maintenance schedules and procedures. Fuel additives must be used. ⇨ ***Additives (🗋 102)***.
AVCAT FSII, NATO F44, JP5, MIL T5624, DERD 2452, AVTOR		
NATO F35, JET A1, DEF STAN 91-91, DERD 2494, JP7		
AVCAT, NATO F43 (obsolete), JP5 without additives		
JET A (ASTM D1655)		
ASTM D3699 Kerosene		
B20 Biodiesel - RME content blended with mineral derived diesel (20% maximum) - ASTM D6751, DIN 51606, ISO 14214	Dieselmax engines manufactured from 2007 on only(1).	You must obey special routine maintenance schedules and procedures. ⇨ ***Warranty (🗋 102)***.
AVTAG (obsolete)	These fuels are not acceptable with or without additives. Engines must not be operated with these fuels.	
AVTAG FSII (obsolete), NATO F40, JP4, DERD 2454		
JET B (ASTM D1655)		
BS MA100		
JIS K2203 No.2		
Unmodified vegetable oils		

(1) The year of manufacture is part of the engine serial number. Refer to Typical Engine Identification Number.

Additives

The additives listed below are advertised as being suitable for bringing the lubricity levels of kerosene/low sulphur fuels up to those of diesel fuels. They must be used as specified by your fuel supplier who will understand the concentration level necessary.

- Elf 2S 1750. Dosage 1000-1500 ppm (0.1 - 0.15%), specifically for Indian Superior Kerosene (SKO) but may be applicable to other fuels.
- Lubrizol 539N. Dosage (on Swedish low sulphur fuel) 250 ppm.
- Paradyne 7505 (from Infineum). Dosage 500 ppm (0.05%).

Note: *These products are given as examples only. The information is derived from the manufacturers data. The products are not recommended or endorsed by JCB.*

Service Requirements for use of B20 Biodiesel

- The engine oil must be a grade CH4 as minimum specification.
- Do not leave unused B20 biodiesel in the fuel tank for extended periods (top up each day).
- Make sure that 1 in 5 fuel tank fills use standard diesel to EN590 specification, this will help to prevent 'gumming'.
- Make sure regular oil sampling is completed (look for excessive unburnt fuel content, water or wear particles.
- Change the engine oil and filter more frequently (as a minimum half the recommended intervals), or as indicated by oil sampling.
- Change the fuel filters more frequently (as a minimum half the recommended intervals), or if there are engine performance related issues.
- Make sure the fuel is stored correctly, care must be taken to make sure no water enters the machine fuel tank (or the storage tank). Water will encourage mico-bacterial growth.
- Make sure that the fuel pre-filter is drained daily (not every week as currently advised).
- Only JCB engines built after Jan. 2007 are applicable (i.e. engines with 07 on the end of their serial number and factory filled with CH4 oil) - this is not approved with other manufacturers.
- Use heater kits in low ambient temperature territories.
- The biodiesel must meet the following standards: ASTM D6751, DIN 51606, ISO 14214

Note: *If necessary use a test kit to confirm the fuel specification. Testing kits are available (not from JCB currently), use the internet as a source for the kits.*

Note: *If performance related issues are to be reported to JCB Service, and the engine has been run on biodiesel, then the fuel system must be filled with standard diesel (at least 2 x tank fills) to EN590 specification and relevant stall speeds recorded prior to making the report.*

Warranty

JCB have shown a commitment to support the environment by approving the use of biodiesel blended fuels.

Using a B20 blend of biodiesel requires caution and additional servicing of the engine is required. ⇨ ***Service Requirements for use of B20 Biodiesel (102)***.

Failure to follow the additional recommended service requirements may lead to a warranty claim being declined.

Failures resulting by the incorrect use of biodiesels or other fuel additives are not defects of the JCB Dieselmax engine workmanship and therefore will not be supported by JCB Warranty.

Sulphur Content

T3-032

High sulphur content can cause engine wear. (High sulphur fuel is not normally found in North America, Europe or Australia.) If you have to use high sulphur fuel you must change the engine oil more frequently. ⇨ *Table 3. Sulphur Content (103)*.

Low sulphur fuels must have the appropriate fuel lubricity additives, these lubricity improvers must not create residual deposits that block the fuel system, e.g. injectors, filters etc. Contact your fuel Supplier.

⚠ CAUTION

A combination of water and sulphur will have a corrosive chemical effect on fuel injection equipment. It is essential that water is eradicated from the fuel system when high sulphur fuels are used.

ENG-3-2

Table 3. Sulphur Content

Percentage of sulphur in the fuel (%)	Oil Change Interval
Less than 0.5	Normal
0.5 to 1.0	0.75 of normal
More than 1.0	0.50 of normal

Effects of Fuel Contaminates

T3-033

The effect of dirt, water and other contaminants in diesel can be disastrous for injection equipment:

- Dirt - A severely damaging contaminant. Finely machined and mated surfaces such as delivery valves and distributor rotors are susceptible to the abrasive nature of dirt particles - increased wear will almost inevitably lead to greater leakage, uneven running and poor fuel delivery.
- Water - Water can enter fuel through poor storage or careless handling, and will almost inevitably condense in fuel tanks. The smallest amounts of water can result in effects that are just as disastrous to the fuel injection pump as dirt, causing rapid wear, corrosion and in severe cases, even seizure. It is vitally important that water is prevented from reaching the fuel injection equipment. The filter/water trap must be drained regularly.
- Wax - Wax is precipitated from diesel when the ambient temperature falls below that of the fuel's cloud point, causing a restriction in fuel flow resulting in rough engine running. Special winter fuels may be available for engine operation at temperatures below 0°C (32°F). These fuels have a lower viscosity and limit wax formation.

Prepare the Machine for Maintenance

Introduction

⚠ WARNING

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

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

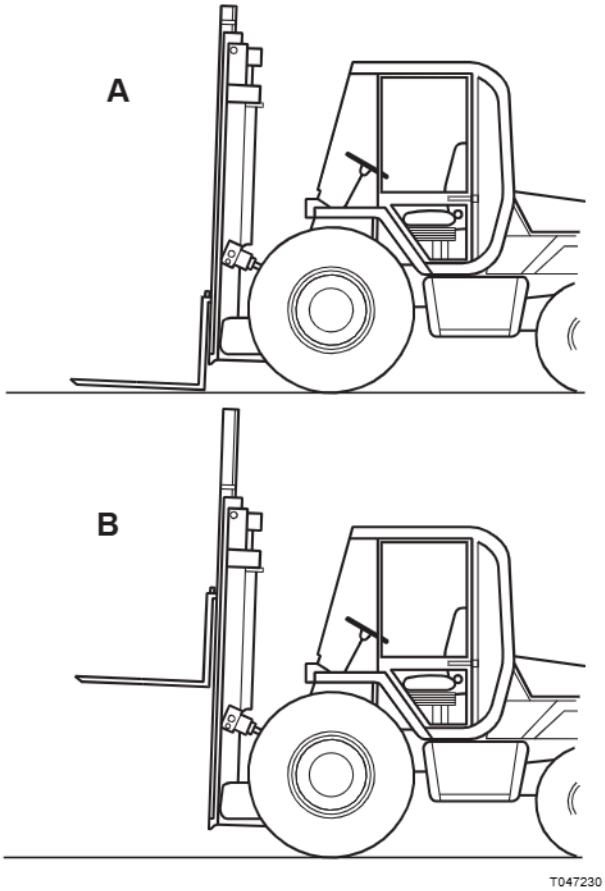
To prevent anyone starting the engine, remove the starter key. Disconnect the battery when you are not using electrical power. If you do not take these precautions you could be killed or injured.

8-3-1-1

Make the machine safe before you start a maintenance procedure.

You can complete most of the maintenance procedures with the mast lowered (Position **A**). Unless a maintenance procedure instructs you differently, you must lower the mast. Refer to ***How to Make the Machine Safe (Mast Lowered)***.

If you lift the mast to get access for maintenance (Position **B**), you must install the mast chains on the mast. Refer to ***How to Make the Machine Safe (Mast Lifted)***.



T047230

Fig 69.

How to Make the Machine Safe (Mast Lowered)

Important: *You can complete most of the maintenance procedures with the mast lowered. Unless a maintenance procedure instructs you differently, you must lower the mast.*

1 Park the machine on level, solid ground.

If necessary, refer to ***Stopping and Parking the Machine*** in the Operator Manual.

2 Lower the mast.

3 Put the attachment flat on the ground.

4 Stop the engine and remove the starter key.

5 Disconnect the battery to prevent accidental operation of the engine.

6 If necessary, put chocks against the two sides of the wheels before you get below the machine.

How to Make the Machine Safe (Mast Lifted)

⚠ WARNING

Mast Support Chains

You can be killed or injured if the mast/carriage drops while you are working under it. Install the mast support chains before working beneath a raised mast/carriage.

9-1-4-2_2

⚠ CAUTION

Stand on a serviceable working platform to fit/remove chain(s). Do not lean a ladder against the mast - it can slip off. Do not stretch as you could lose balance and fall.

9-3-4-2_1

Installing the Mast Support Chains

1 Park the machine on firm level ground. Apply the park brake.

2 Remove any load and attachment from the carriage.

3 Select the number of chains required (as shown) of 1 ton (1000 kg) minimum safe working load. Inspect the chains to make sure they are serviceable.

Table 4. Number of Chains Required

Mast Type	Illustration	Qty
Typical Duplex Mast	⇨ *Fig 70. (106)*.	2
Typical Triplex Mast	⇨ *Fig 71. (106)*.	3
Typical Freelift Mast	⇨ *Fig 72. (107)*.	3

4 Raise the carriage to give enough clearance to complete the task. Switch OFF the engine and remove the starter key.

⚠ WARNING

Make sure the chain(s) are secured correctly.

9-3-4-3

5 Fit the support chain(s) as shown.

6 Lower the carriage so that the support chain(s) restrain the mast carriage.

7 Vent the hydraulic system. Refer to **Hydraulic System, Releasing the Hydraulic Pressure**.

8 Check the support chain(s) for total safety.

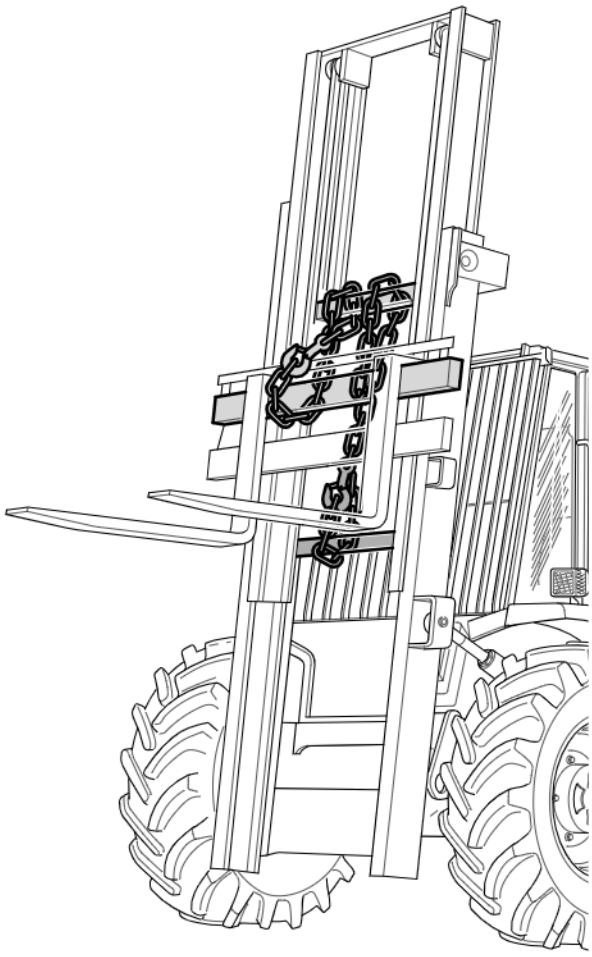


Fig 70. Typical Duplex Mast

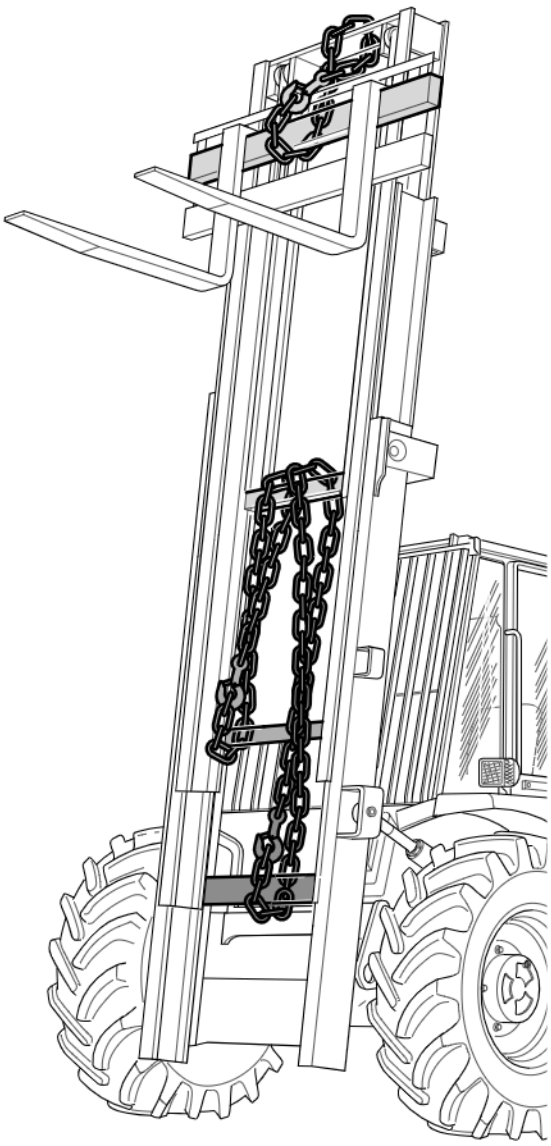


Fig 71. Typical Triplex Mast

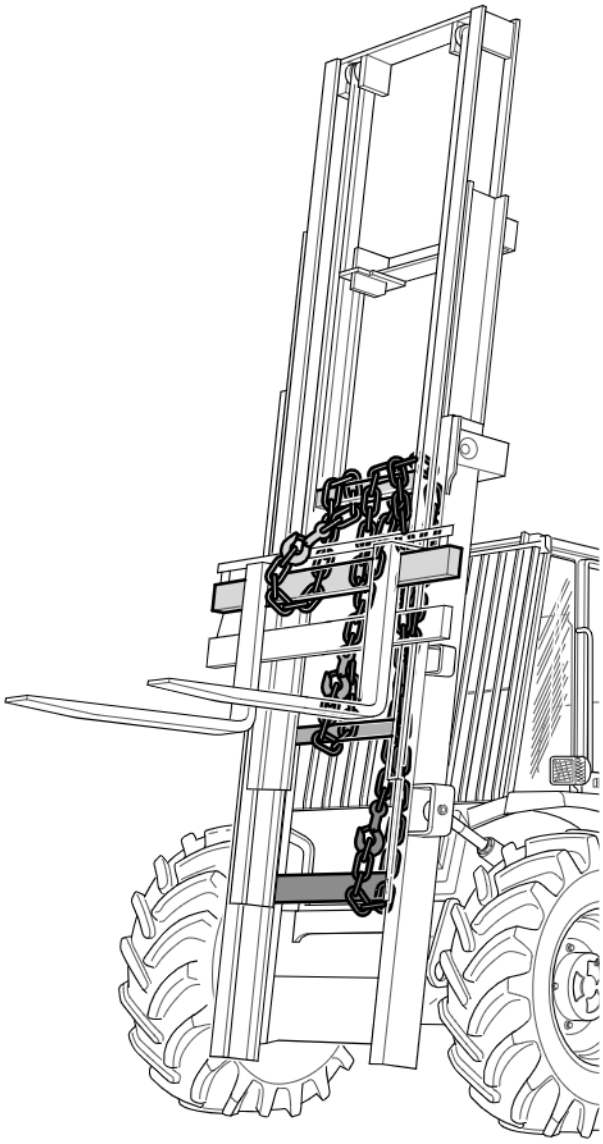


Fig 72. Typical Freelift Mast

Removing the Mast Support Chains

1 Raise the mast/carriage to take the weight off the chains.

2 Switch OFF the engine and remove the starter key.

3 Remove the chain(s).

Cleaning the Machine

Introduction

T3-062_3

Clean the machine using water and or steam. Do not allow mud, debris etc. to build upon the machine.

Before carrying out any service procedures that require components to be removed:

1 Cleaning must be carried out either in the area of components to be removed or, in the case of major work, or work on the fuel system, the whole engine and surrounding machine must be cleaned.

2 When cleaning is complete move the machine away from the wash area, or alternatively, clean away the material washed from the machine.

Important: *When removing components be aware of any dirt or debris that may be exposed. Cover any open ports and clean away the deposits before proceeding.*

Detergents

Avoid using full strength detergent - always dilute detergents as per the manufacturer's recommendations, otherwise damage to the paint finish may occur.

Always adhere to local regulations regarding the disposal of debris created from machine cleaning.

Pressure Washing and Steam Cleaning

⚠ WARNING

When using a steam cleaner, wear safety glasses or a face shield as well as protective clothing. Steam can cause serious personal injury.

13-3-2-10_2

⚠ CAUTION

The engine or certain components could be damaged by high pressure washing systems; special precautions must be taken if the engine is to be washed using a high pressure system.

Ensure that the engine air intake, alternator, starter motor and any other electrical components are shielded and not directly cleaned by the high pressure cleaning system.

ENG-3-3_2

Important: *Do not aim the water jet directly at bearings, oil seals, the engine air intake or electrical and electronic components such as the engine electronic control unit (ECU), alternator or fuel injectors.*

Use a low pressure water jet and brush to soak off caked mud or dirt.

Use a pressure washer to remove soft dirt and oil.

Note: *The machine must always be greased after pressure washing or steam cleaning.*

Preparing the Machine for Cleaning

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

Important: *Stop the engine and allow it to cool for at least one hour. Do not attempt to clean any part of the engine while it is running.*

2 Make sure that the electrical system is isolated.

3 Make sure that all electrical connectors are correctly coupled. If connectors are open fit the correct taps or seal with waterproof tape.

Cleaning the Machine

⚠ WARNING

To avoid burning wear personal protective equipment (PPE) when handling hot components. To protect your eyes, wear personal protective equipment (PPE) when using a brush to clean components.

HYD-1-3_3

⚠ WARNING

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

5-3-1-12_3

⚠ CAUTION

Never use water or steam to clean inside the cab. The use of water or steam could damage the on-board computer and render the machine inoperable. Remove dirt using a brush or damp cloth.

8-3-4-8

Pay particular attention to the following areas:

1 Cleaning the Tubes/Fins

If the radiator tubes/fins get clogged the radiator will be less efficient.

a Remove the radiator grille.

b Open the bonnet and clean the radiator. Brush off all debris from the cooler tubes and fins. Make sure the loosened material is brushed out of the cooler enclosure.

c Close the bonnet and fit radiator grille.

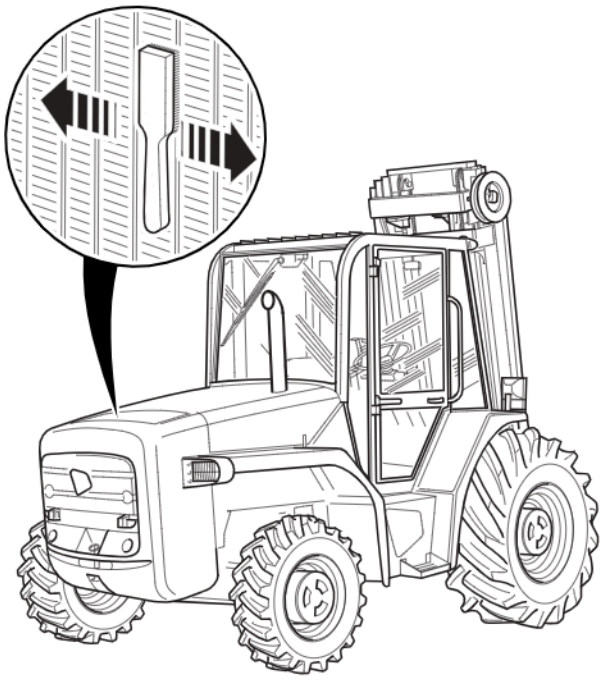


Fig 73.

2 Engine

Do not allow mud to build up on the engine and transmission. Pay particular attention to the exhaust area, remove all combustible material.

The engine or certain components could be damaged by high pressure washing systems, special precautions must be taken if the engine is to be washed using a high pressure system.

Note: *Do not place the jet nozzle closer than 600mm (24 in) to any part of the engine.*

Do not attempt to clean any part of the engine while it is running. Stop the engine and allow it to cool for at least one hour.

a Disconnect the battery.

b Do not aim the jet wash directly at the fuel injector seals **F**. ⇨ *Fig 74. (🗋 110)*.

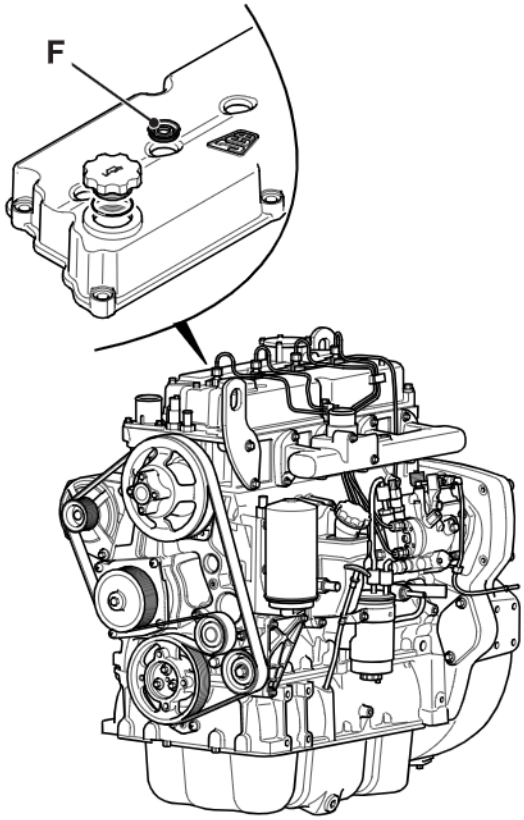


Fig 74.

c Do not wash any part of the:

i Fuel injection pump.

ii Cold start device.

iii Electrical shut off solenoid (ESOS).

iv Electrical connections.

d Ensure that the alternator, starter motor and any other electrical components are shielded and not directly cleaned by high pressure cleaning system.

Checking for Damage

Check the Machine Body and Structure

T3-063_5

Make sure that all guards and protective devices are in place, attached by their locking devices and free from damage.

Inspect all steelwork for damage. Pay particular attention to the following:

- Inspect all lifting point welds.
- Inspect all pivot point welds.
- Inspect the condition of all pivot pins.
- Check pivot pins are correctly in place and secured by their locking devices.

Check steps and handrails are undamaged and secure.

Check for broken, cracked or crazed window glass and mirrors. Replace damaged items.

Check all lamp lenses for damage.

Check all attachment teeth are undamaged and secure.

Check all safety and instructional labels are in place and undamaged. Fit new labels where necessary.

Note damaged paintwork for future repair.

Check the Tyres

T3-065_2

⚠ 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. Recognise the speed limitation of the tyres fitted and do not operate at more than their recommended maximum speed.

13-2-1-2

Always drive with consideration for the condition of the tyres. Incorrect tyre pressures will affect the stability of the machine. Check the tyres daily for the correct tyre pressure and signs of damage. For example:

- Signs of distortion (bulges)
- Cuts or wear
- Embedded objects (nails, etc.)

Install the valve caps firmly to prevent dirt from entering the valve. Inspect for leaks when you check the tyre pressures.

Inspect the tyre valve for leaks, when you check the tyre pressures.

Check the Seat and Seat Belt

T3-008_2

⚠ WARNING

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

2-3-1-7_1

Inspect the seat belt for signs of fraying and stretching. Check that the stitching is not loose or damaged. Check that the buckle assembly is undamaged and works correctly.

Check that the belt mounting bolts are undamaged, correctly fitted and tightened.

Check seats are undamaged and secure. Check seat adjustments for correct operation.

Check the Hydraulic Hoses and Fittings

T3-072

⚠ WARNING

Hydraulic Hoses

Damaged hoses can cause fatal accidents. Inspect the hoses regularly. Do not use the machine if a hose or hose fitting is damaged.

INT-3-3-2_4

Inspect the hoses regularly for:

- Damaged hose ends
- Chafed outer covers
- Ballooned outer covers
- Kinked or crushed hoses
- Embedded armouring in outer covers
- Displaced end fittings

Do not use the machine if a hose or hose fitting is damaged. Replace damaged hoses before you use the machine again.

Replacement hoses must be of the same size and standard.

Check the Electrical Circuits

T3-099

Inspect the electrical circuits regularly for:

- Damaged connectors
- Loose connections
- Chafing on wiring harnesses
- Corrosion
- Missing insulation
- Incorrect routing of harness

Do not use the machine if one or more of these faults are found. You must make sure that the electrical circuit is repaired immediately.

Checking the ROPS/FOPS Structure

⚠ WARNING

You could be killed or seriously injured if you operate a machine with a damaged or missing ROPS/FOPS. If the Roll Over Protection Structure (ROPS)/Falling Objects Protection Structure (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_6

For assistance, contact your JCB distributor. Failure to take these precautions could result in death or injury to the operator.

Check the structure for damage. Check that the mounting bolts are installed and undamaged. Check the bolt torques. ⇨ *Table 5. Torque Settings (🗋 112)*. Tighten them to the correct torque if necessary.

Table 5. Torque Settings

Item	Nm	lbf ft
A	238	175

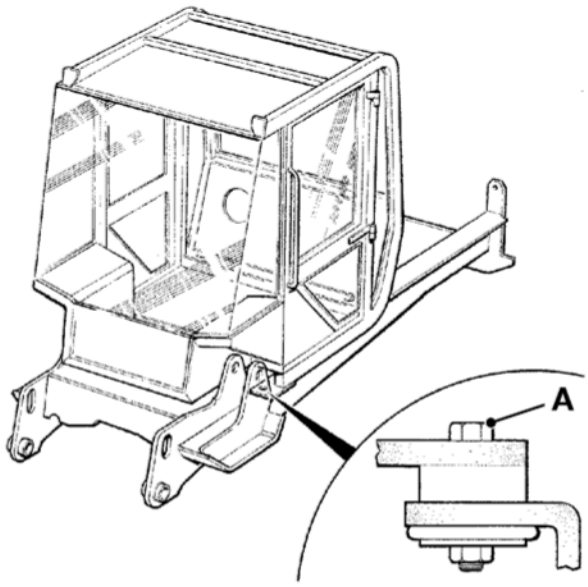


Fig 75.

Check the Screen Guard and Load backrest extension (if fitted)

Check the screen guard and load backrest extension for damage and renew if damaged.

Check that the mounting bolts are installed and undamaged.

For assistance, contact your JCB distributor. Failure to take these precautions could result in death or injury to the operator.

Greasing

Introduction

T3-028_2

You must grease the machine regularly to keep it working efficiently. Regular greasing will also lengthen the machine's working life. Refer to the ***Service Schedule*** for the correct intervals.

Note: *The machine must always be greased after pressure washing or steam cleaning.*

Greasing should be done with a grease gun. Normally, two strokes of the gun should be sufficient. Stop greasing when fresh grease appears at the joint. Use only the recommended type of grease. Do not mix different types of grease, keep them separate.

In the following illustrations, the grease points are numbered. Count off the grease points as you grease each one. Refit the dust caps after greasing.

Note: *Where applicable, refer to the manufacturers manual for instructions on the maintenance of optional attachments.*

⚠ CAUTION

Waxoyl contains turpentine substitute which is flammable. Keep flames away when applying Waxoyl. Waxoyl can take a few weeks to dry completely. Keep flames away during the drying period.

Do not weld near the affected area during the drying period. Take the same precautions as for oil to keep Waxoyl off your skin. Do not breathe the fumes. Apply in a well-ventilated area.

5-3-1-9

Preparing the Machine for Greasing

Make the machine safe before you start a greasing procedure. Refer to ***Prepare the Machine for Maintenance***.

Important: *You can complete most of the greasing procedures with the mast lowered. If you lift the mast to get access for greasing, you must install the mast support chains, Refer to* ***Prepare the Machine for Maintenance****.*

⚠ WARNING

You will be working close into the machine for these jobs. Lower the attachments if possible. Remove the starter key and disconnect the battery. This will prevent the engine being started. Make sure the park brake is engaged.

Block all four wheels before getting under the machine.

2-3-2-1

Daily

Rear Axle Pivot Pin

2 Grease Points.

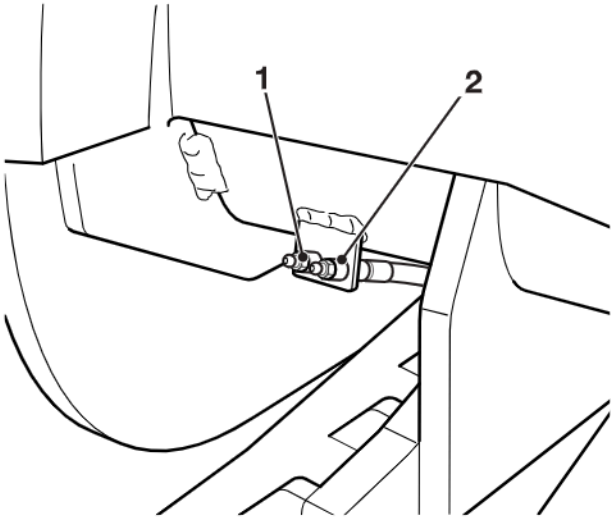


Fig 76.

Rear Axle

14 grease points.

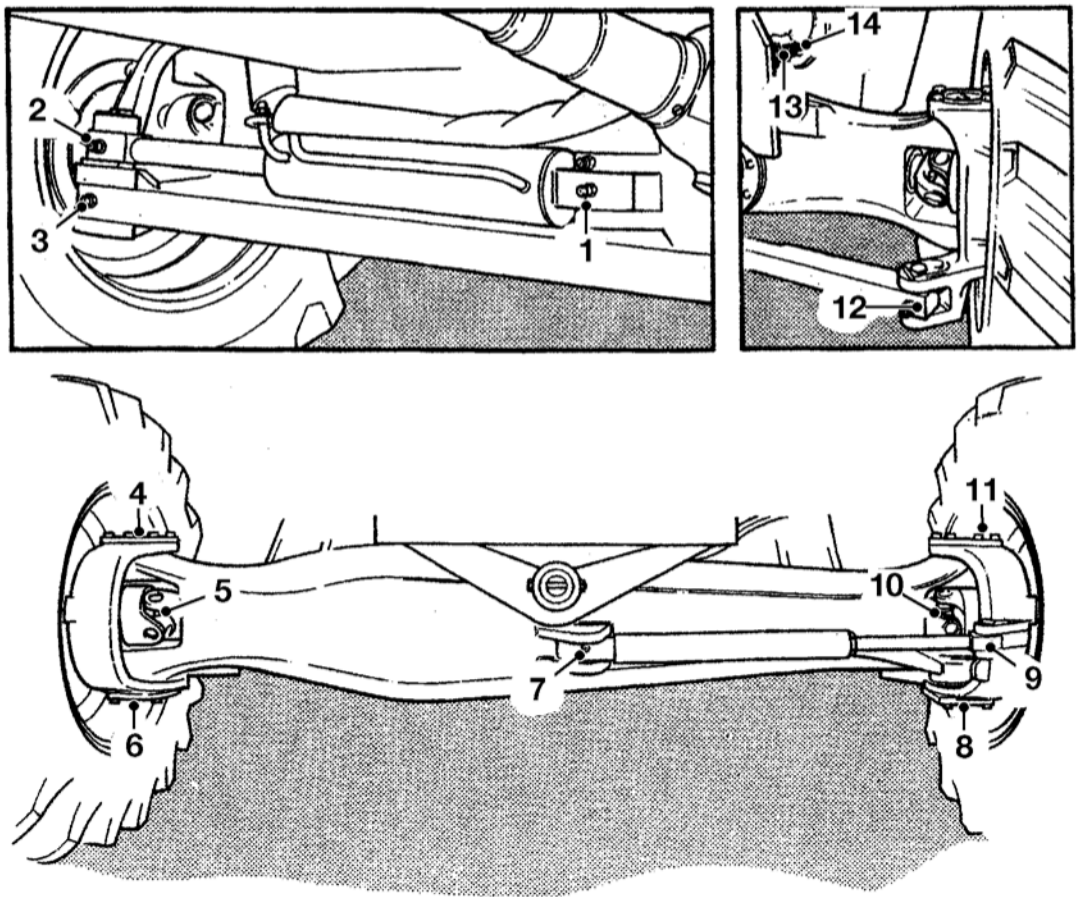


Fig 77.

Rear Driveshafts (4 Wheel Drive Machines)

3 grease points.

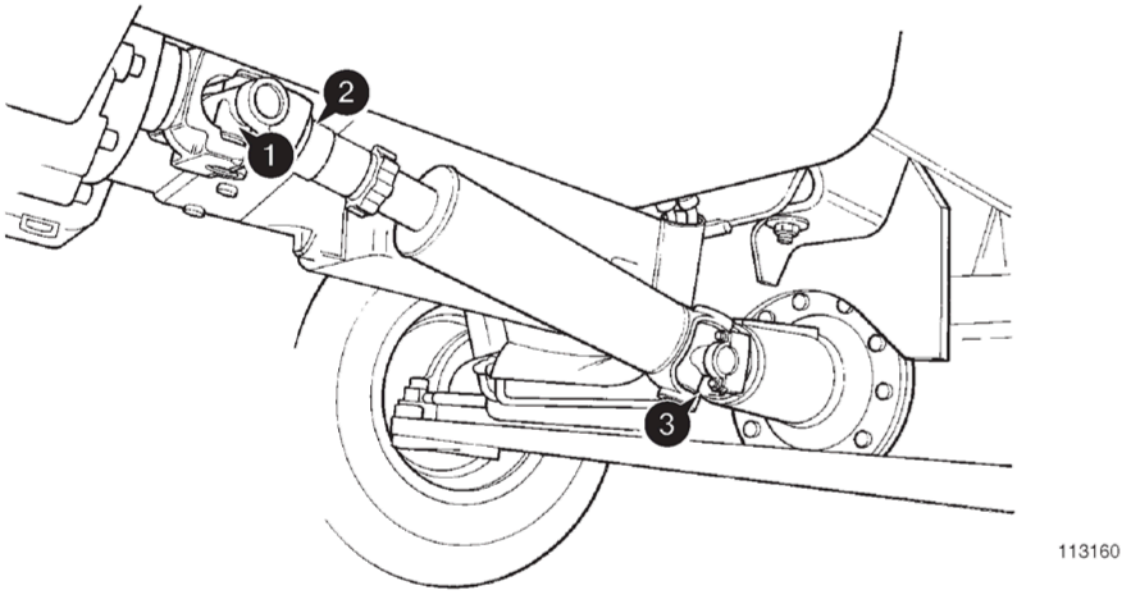


Fig 78.

Front Driveshaft

3 grease points.

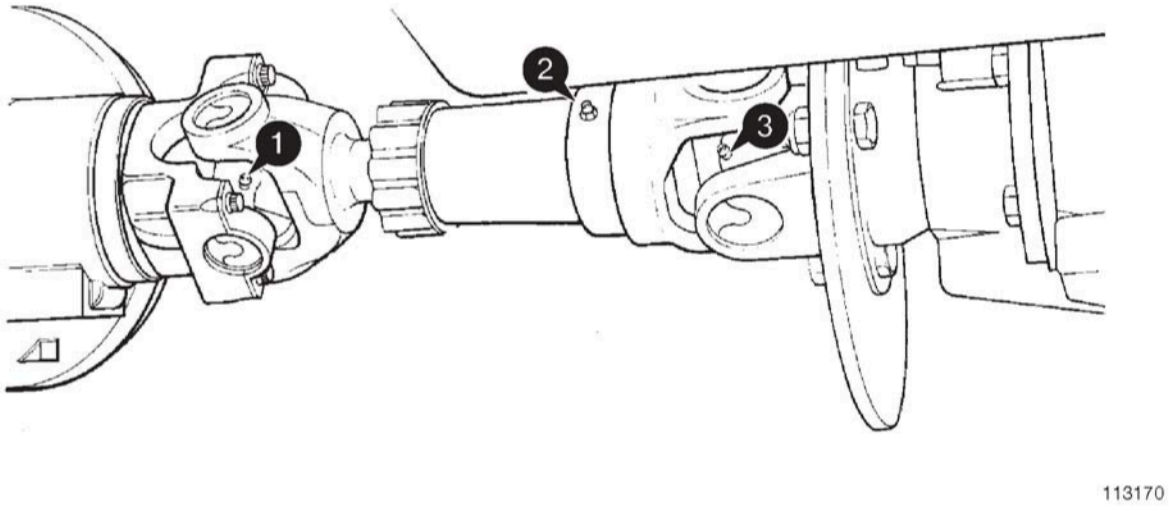


Fig 79.

Mast Tilt Rams and Pivots

6 grease points.

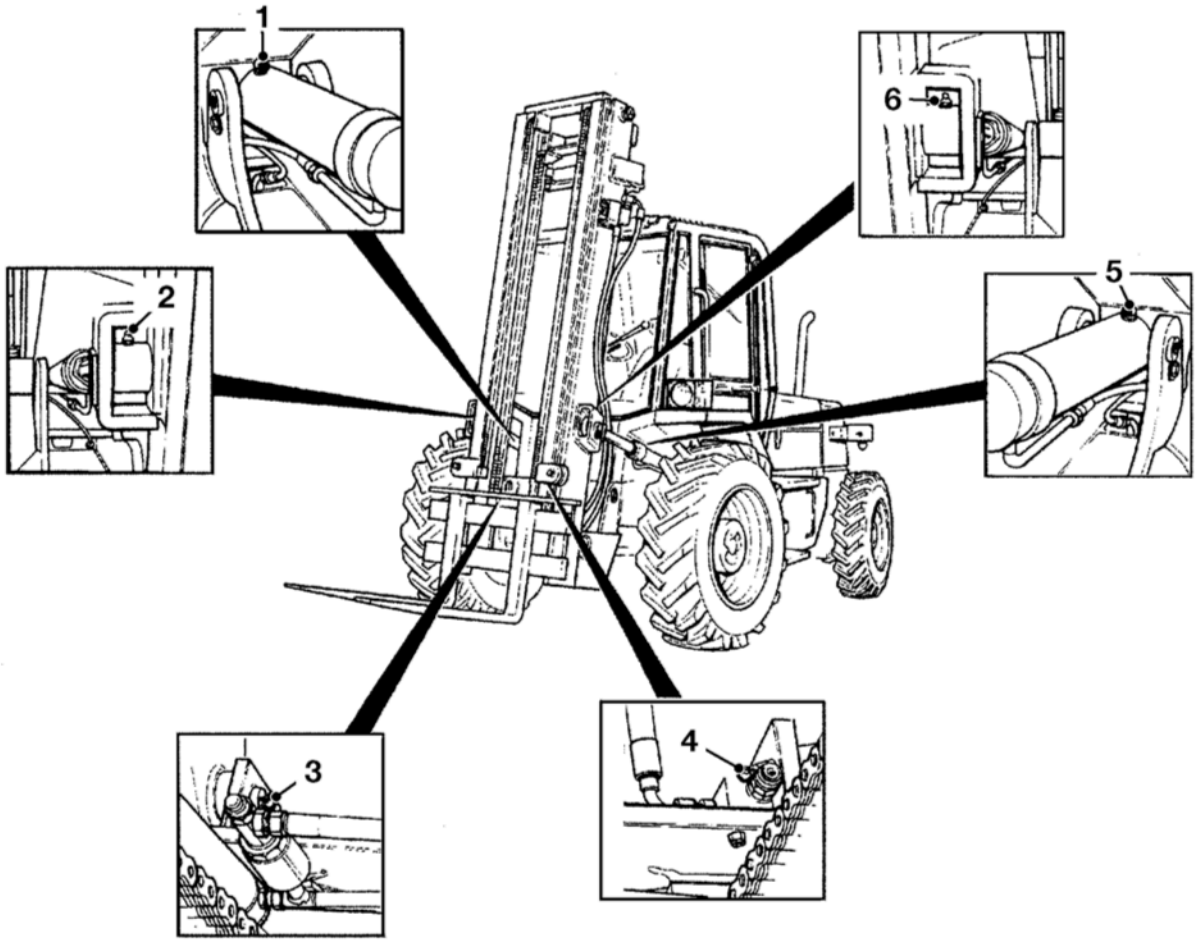


Fig 80.

250 Hours

Mast Chains

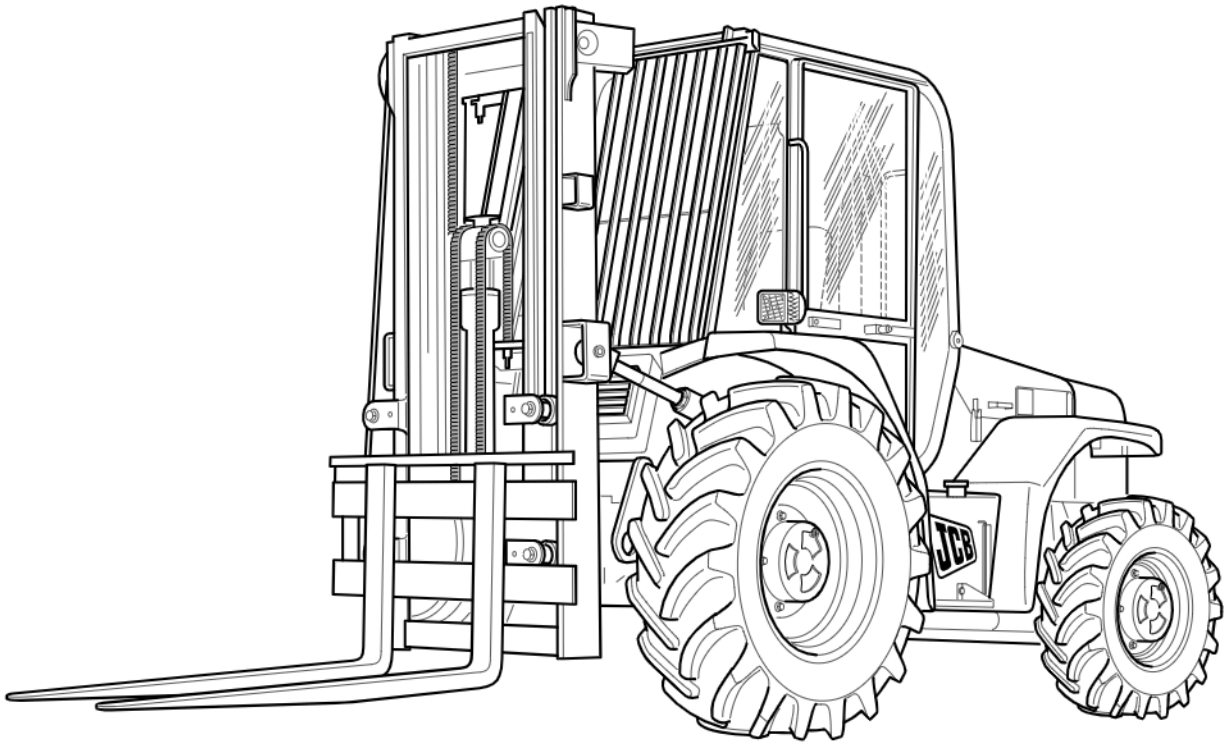


Fig 81.

Remove old oil and apply JCB Chain Lubricant. Make sure the chains are slack before applying lubricant.

Oiling

The following points should be lightly oiled with engine oil.

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Park Brake Cable

⚠ WARNING

Oil on the brake disc will reduce brake effectiveness. Keep oil away from the brake disc. Remove any oil from the disc with a suitable solvent. Read and understand the solvent manufacturer's safety instructions. If the pads are oily, new ones must be fitted.

2-3-2-3_3

Oil the clevis **A** and pivots at the brake end of the cable.

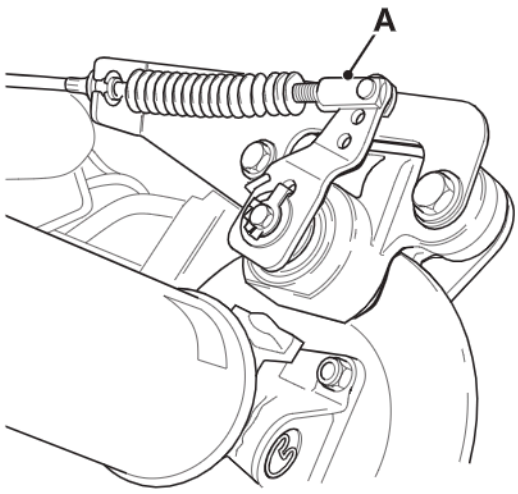


Fig 82.

Control Levers

Oil the clevis **A** of each hydraulic control lever. Remove the gaiter retaining plate **B** and lift the lever gaiter **C** to gain access to the clevises.

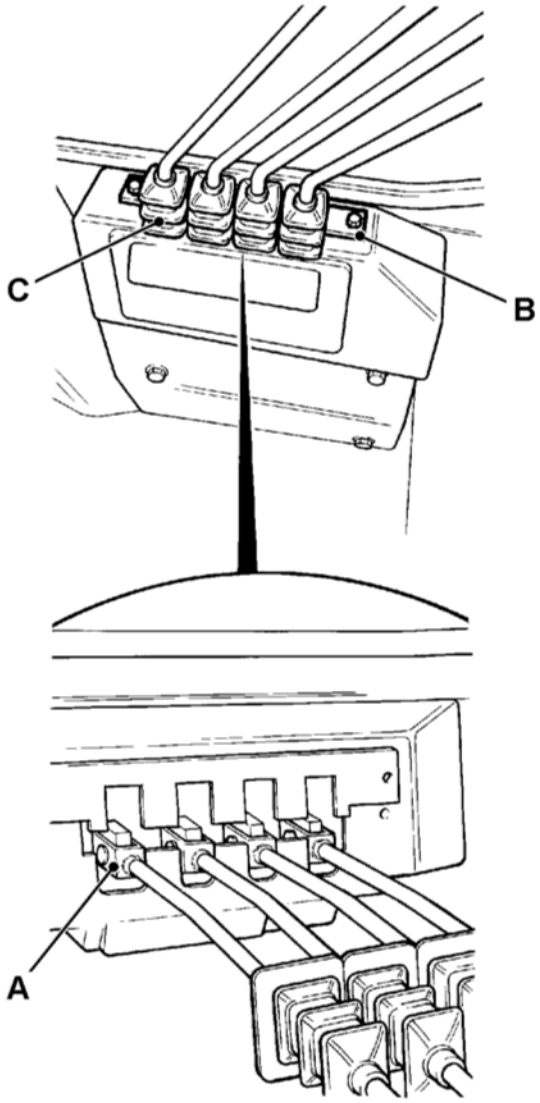


Fig 83.

Cylinder Bores and Rods

Fully raise and lower the mast daily to lubricate the cylinder bores and cylinder rods.

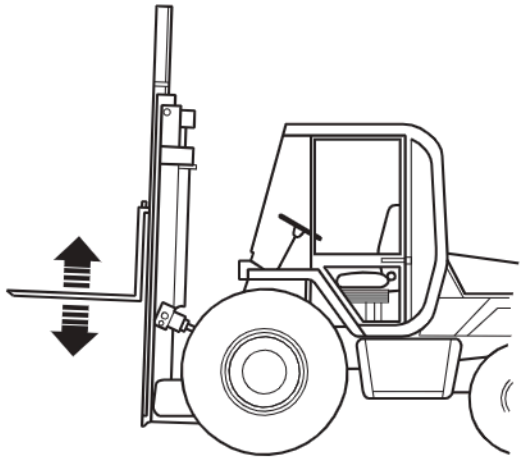


Fig 84.

Access Panels

Introduction

T3-100

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

Before you operate the machine, make sure that all of the access panels are in their operation position and secure.

Engine Cover

Opening and Closing

Access to the engine is by opening the cover **A**.

⚠ WARNING

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

5-2-6-5

⚠ WARNING

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

10-1-1-40

Important: *Before you stop the engine, you must allow the engine to operate at low idle for four minutes. The delay allows the coolant temperatures to stabilise before you open the engine cover.*

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance.**

2 Release latches **B**. Allow the cover to raise on it's gas strut. Keep hold of the handles **C** while it rises.

Important: *Do not leave the cover raised part-way; it can creep down.*

3 Lower the cover **A** and engage latches **B**.

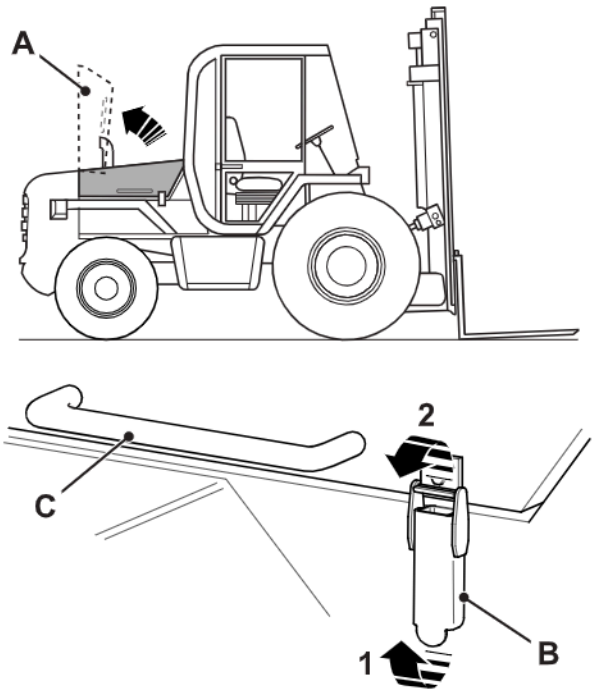


Fig 85.

Engine Side Panels

The machine is fitted with engine side panels **A**, located either side of the engine. The panels can be removed to provide better access for maintenance tasks.

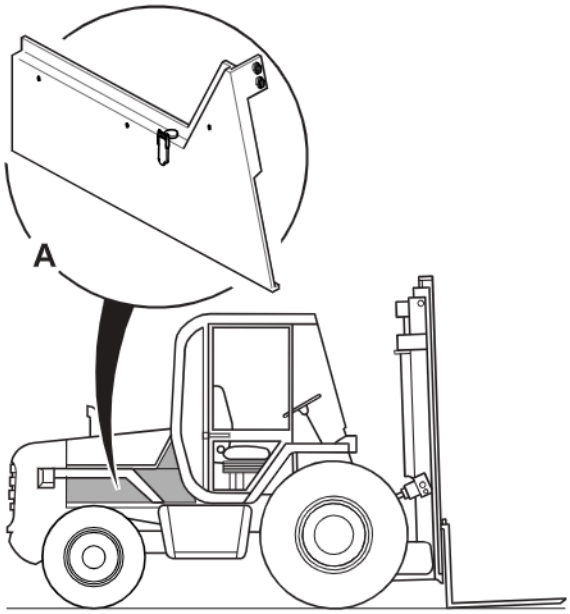


Fig 86.

To remove a panel:

1 Open the engine cover. ⇨ *Access Panels (🗋 121)*.

2 Remove the four panel fasteners, located inside the engine compartment.

3 Lift the panel clear.

Important: *The engine side panels must be replaced upon completion of maintenance work.*

Brakes

Park Brake

Introduction

T3-071

⚠ WARNING

Do not use a machine with a faulty park brake.

3-2-3-10_2

⚠ WARNING

Non approved modifications to drive ratios, machine weight or wheel and tyre sizes may adversely affect the performance of the park brake.

3-2-3-11

Make sure that you obey all health and safety precautions before you test or adjust the park brake.

If you have any queries concerning the park brake test or adjustment procedures, consult your local JCB distributor.

Testing the Park Brake

T3-087

⚠ WARNING

Before testing the park brake make sure the area around the machine is clear of people.

2-2-4-5



A339340

- The park brake must be fully engaged when the lever is vertical.
- The park brake warning light must come on when the park brake is engaged and forward or reverse is selected (starter switch at **I**).

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

2 Fully apply park brake.

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

4 Select fourth gear.

5 Push down hard on foot brake pedal.

6 Select forward drive. The park brake warning light must illuminate.

⚠ WARNING

If the machine starts to move during the following test, immediately apply the foot brake and reduce the engine speed.

2-2-5-1

7 Test the park brake as follows:

a Move the park brake lever fractionally forward until the park brake warning light is just extinguished.

b Slowly release the foot brake pedal.

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

Note: *Do not do this test for longer than 20 seconds.*

d Reduce engine speed to idle and select neutral.

e Return the park brake lever to the fully on position.

f Lower attachments and stop the engine.

8 If the machine moved during the test, adjust the park brake and repeat the test. Refer to ***Park Brake Adjustment***.

Park Brake Adjustment

⚠ WARNING

Over adjustment of the park brake could result in the park brake not fully releasing.

0011

1 Disengage the park brake (lever horizontal).

2 Turn handle grip **A** clockwise, half a turn.

3 Test the park brake.

4 If the brake fails the test, repeat steps 1, 2 and 3. If there is no more adjustment and pin **B** is at the end of its travel get the brake checked by your JCB dealer.

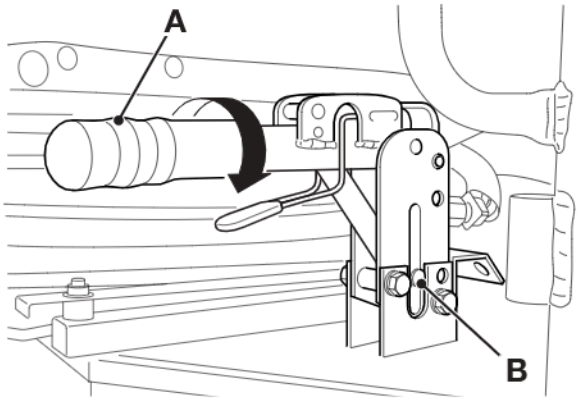


Fig 87.

Foot Brake

Checking the Foot Brake Fluid Level

⚠ WARNING

Faulty brakes can kill. If you have to top up the brake reservoir frequently, get the brake system checked by your JCB Dealer. Do not use the machine until the fault has been put right.

2-3-2-5_1

The brake master cylinder reservoir is in the engine compartment.

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

2 The correct fluid level is marked on the reservoir. If necessary, add fluid as in Step 3. If the level has fallen below the MIN mark, get the system checked by your JCB distributor.

⚠ CAUTION

Using incorrect fluid could damage the system. See Fluids, Capacities and Lubricants for the correct fluid. The fluid can harm your skin. Wear rubber gloves. Cover cuts or grazes.

2-3-5-1_2

3 Remove the reservoir cap **C**. Do no use ordinary brake fluid. Carefully pour in the fluid until it reaches the MAX mark. Avoid spilling it. Wipe up any spillage.

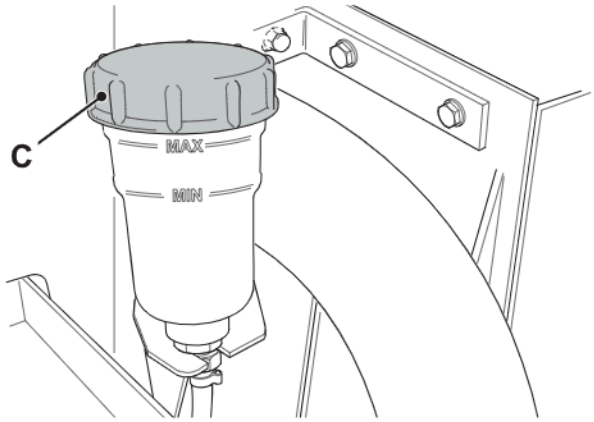


Fig 88.

Electrical System

Battery

Battery Disconnection/Connection

T3-019_4

⚠ WARNING

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

5-2-2-4

Disconnection

1 Get access to the battery. See ***Access Panels***.

2 If the machine has a battery isolator, move the switch to the OFF position then remove the key.

3 Remove the leads. Disconnect the earth (-) terminal first.

Connection

1 Check the battery.

a If the terminal is dirty, clean the post.

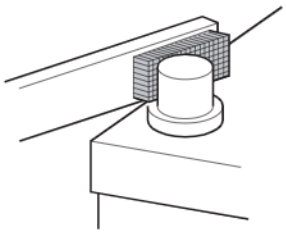


Fig 89.

b If the terminal post is corroded and generates white powder wash the terminal with hot water. If considerable corrosion is detected, clean with a wire brush or abrasive paper.

c After cleaning, apply a thin coat of petroleum jelly to the terminal.

2 Re-connect the leads. Connect the earth (-) terminal last.

3 If the machine has a battery isolator, move the switch to the ON position.

4 Close and lock the access panels.

Checking the Electrolyte Level

T3-020_3

Low maintenance batteries used in normal temperate climate applications should not need topping up. However, in certain conditions (such as prolonged operation at tropical temperatures or if the alternator overcharges) the electrolyte level should be checked as described below.

1 Get access to the battery. See ***Access Panels***.

2 Disconnect and remove battery. See ***Battery Disconnection/Connection.***

⚠ WARNING

Do not top the battery up with acid. The electrolyte could boil out and burn you.

2-3-4-6

3 Remove covers **A**. Look at the level in each cell. The electrolyte should be 6 mm (1/4 in) above the plates. Top up if necessary with distilled water or de-ionized water.

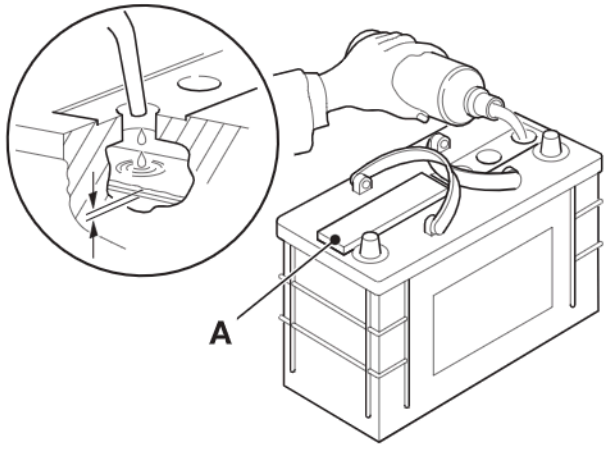


Fig 90. Typical Battery

4 Refit battery.

5 Close and lock the access panels.

Battery Isolator (if fitted)

To disconnect the battery from the machine electrics a battery isolator has been fitted.

⚠ CAUTION

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.

INT-3-1-13

At the end of a working cycle or if the machine is being left unattended, provided the lights are not required, the battery must be isolated. Before attempting to start the engine or use the machine electrics the battery isolator key must be fitted and switched on.

1 To isolate the battery turn the battery isolator key **A** in an anti-clockwise direction **B** and remove. Keep the key in a safe place and available for when the machine is next required.

2 To connect the battery insert the key **A** and turn in a clockwise direction **C**.

⚠ CAUTION

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.

INT-3-1-13

Jump Starting the Engine

T3-092

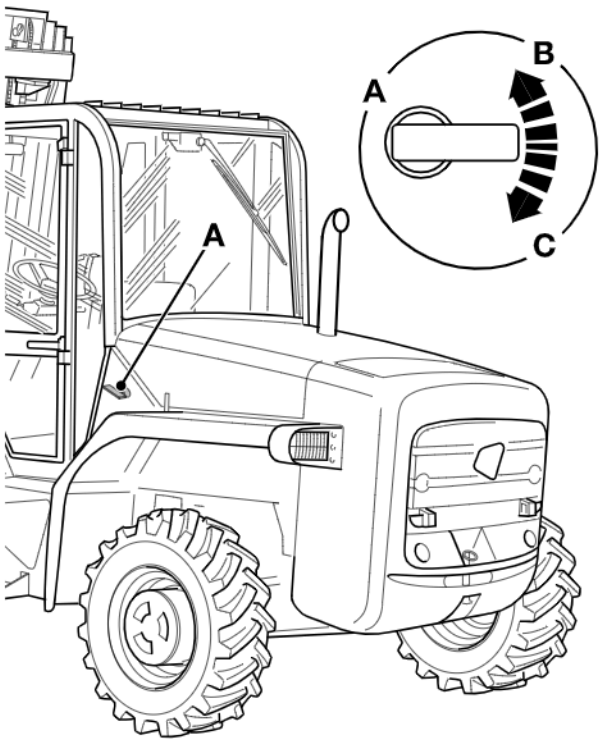


Fig 91.

⚠ WARNING

Do not use a battery if its electrolyte is frozen. To prevent the battery electrolyte from freezing, keep the battery fully charged.

Do not try to charge a frozen battery or jump-start and run the engine, the battery could explode.

Batteries produce a flammable gas, which is explosive; do not smoke when checking the electrolyte levels.

When jump-starting from another vehicle, make sure that the two vehicles do not touch each other. This prevents any chance of sparks near the battery.

Set all the machine switches to their OFF positions before connecting the external power supply. Even with the starter switch set to off some circuits will be energised when the external power supply is connected.

Do not connect the booster (slave) supply directly across the starter motor. Doing this by-passes the neutral gear safety switch. If the machine is in gear, it may 'runaway' and kill or injure bystanders.

Use only sound jump leads with securely attached connectors. Connect one jump lead at a time.

The machine has a negative earth electrical system. Check which battery terminal is positive (+) before making any connections.

Keep metal watch straps and jewellery away from the jump lead connectors and the battery terminals - an accidental short could cause serious burns and damage equipment.

Make sure you know the voltage of the machine. The booster (slave) supply must not be higher than that of the machine. Using a higher voltage supply will damage your machine's electrical system.

If you do not know the voltage of your booster (slave) supply, then contact your JCB dealer for advice. Do not attempt to jump-start the engine until you are sure of the voltage of the booster (slave) supply.

4-2-2-3_1

1 The park brake should have been engaged when the machine was last parked. If it is not engaged, engage it now. The engine will not start unless the park brake is on.

2 Set all switches in the cab to off.

3 Connect the booster cables as follows:

   a Open the engine cover. Refer to ***Access Panels, Engine Cover***.

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

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

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

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

4 Do the Pre-Start Checks.

5 Start the engine.

⚠ WARNING

When the engine is running, there are rotating parts in the engine compartment. Before disconnecting the cables, make sure that you have no loose clothing (cuffs, ties etc.) which could get caught in rotating parts.

2-2-4-3

6 Disconnect the negative booster cable from the machine frame earth. Then disconnect it from the booster supply.

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

7 Close the engine cover.

Fuses

⚠ CAUTION

Fuses

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

8-3-3-5

The electrical circuits are protected by fuses. The fuses are located in a fuse box inside the door. They are in two banks. Each fuse position in each bank is numbered. If a fuse ruptures, find out why and rectify the fault before fitting a new one.

To access the fuses, remove the cover(s).

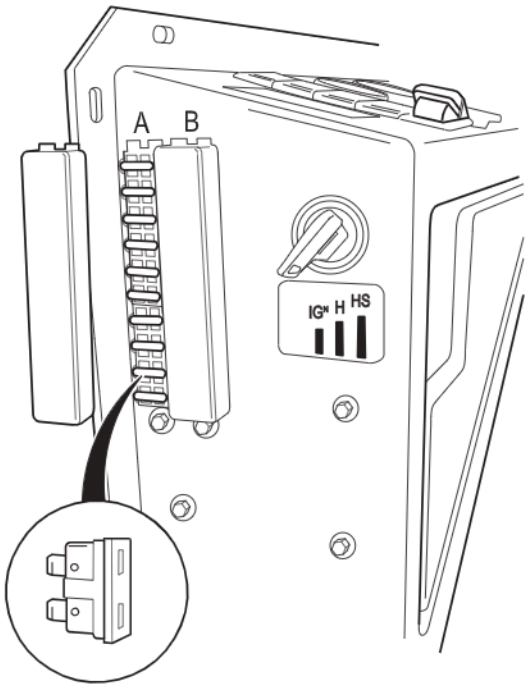


Fig 92.

All Models

	Circuit	Rating
A1	Transmission	7.5
A2	Instrument illumination	5
A3	Brake lights	7.5
A4	Engine Shut-off Solenoid (ESOS)	10
A5	Front wash/wipe	10
A6	Rear/roof wiper	10
A7	Rotating beacon	7.5
A8	Hazard warning lights	10
A9	Horn/main beam	15
B1	Direction indicators	7.5
B2	Dip beam	15
B3	Work lamp	10
B4	Heater fan, Air conditioning	10
B5	Accessory socket	10
B6	Left hand sidelights	5
B7	Right hand sidelights	5
B8	Rear fog light	5

***Note:** All the fuses are shown (including optional equipment fuses). Your machine may not be equipped with all the fuses shown.*



823620-2

Fig 93.

Link Box Fuses

To further protect the machine wiring harnesses and electrical circuits, a fuse link box **A** is fitted as shown. Remember to check the main circuit fuses as well as the link box fuses shown on this page.

Note: *An additional optional fuse may be fitted for cold start.*

Fuse	Circuit	Rating
1	Main lighting, Direction indicators, Heater fan, Work lamp	50
2	Sidelights, Hazard warning lights, Rotating beacon	60
3	Ignition, Front wash/wipe, Brake lights	70
4	Air conditioning	60
5	Cold start grid heater (if fitted)(1)	150

(1) Remove two nuts to release the fuse.

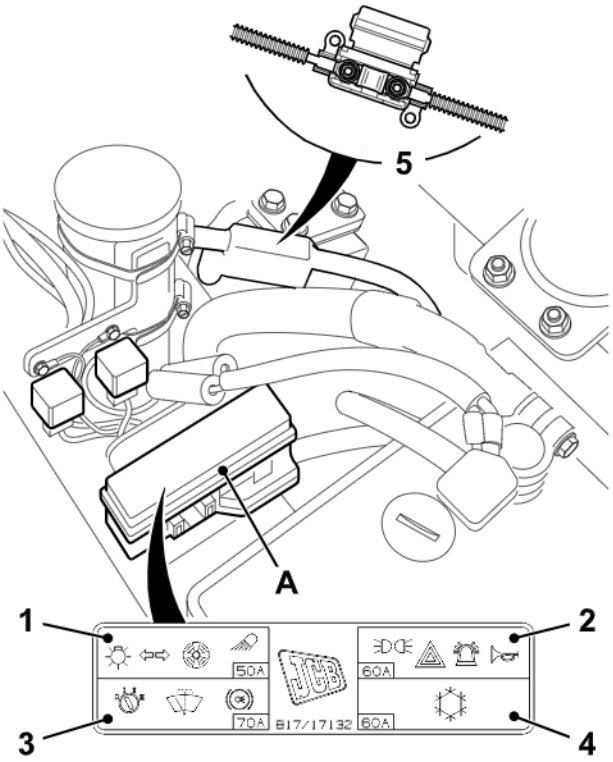


Fig 94.

Relays

All Models

The relays are located behind the side console **J**. They are separated into the banks.

To access the relays, unscrew the five fasteners **K** and remove the panel.

Important: *Isolate the machine's electrics before removing the panel.*

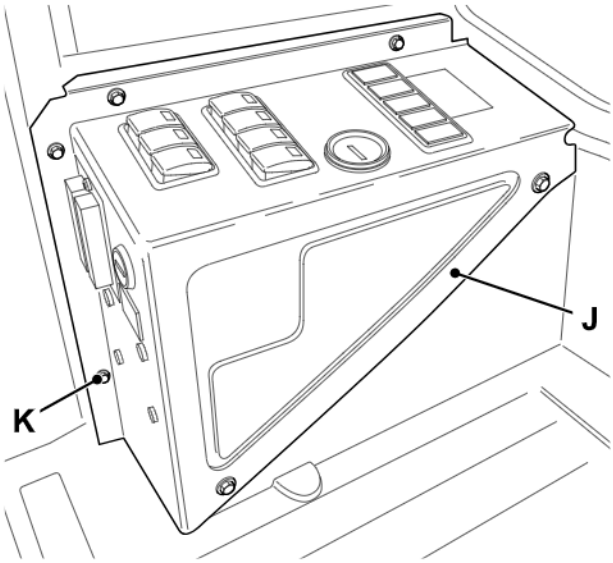


Fig 95. Side Console

Note: *All the relays are shown (including optional equipment relays). Your machine may not be equipped with all the relays shown.*

A Buzzer
B Flashers
C Park brake lamp
D Ignition
E Neutral start
F Transmission dump
G Forward
H Reverse

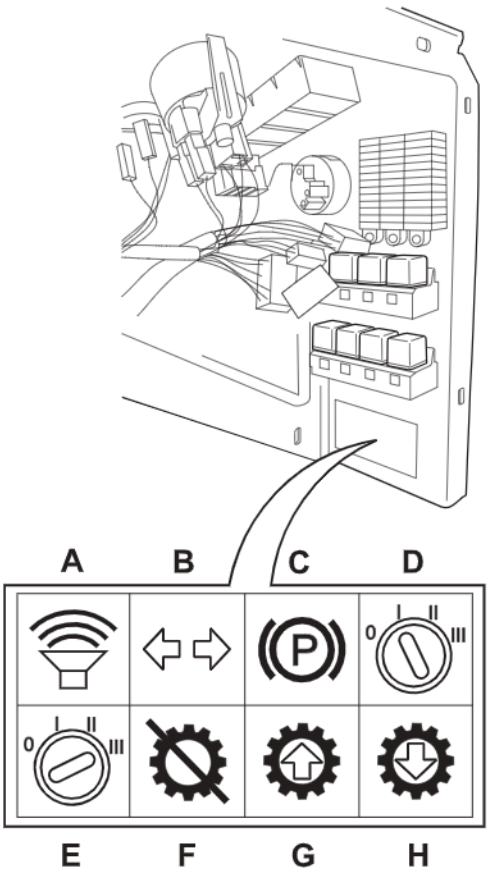


Fig 96.

Air Conditioning (if fitted)

Machines with air conditioning are fitted with two additional relays **A**. The relays are located in the engine compartment, next to the battery.

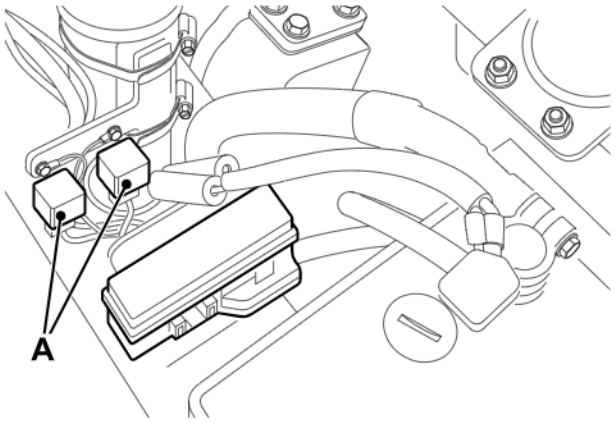


Fig 97.

Engine

Oil and Filter

Checking the Oil Level

1 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

2 Check that the oil level is between the maximum and minimum marks on the dipstick **A**.

⚠ WARNING

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

GEN-1-18

3 If necessary, add the recommended oil through filler **B** to the maximum level. ⇨ ***Fluids, Lubricants and Capacities (99)***.

4 Fit filler cap and dipstick, make sure that they are fully inserted and tightened.

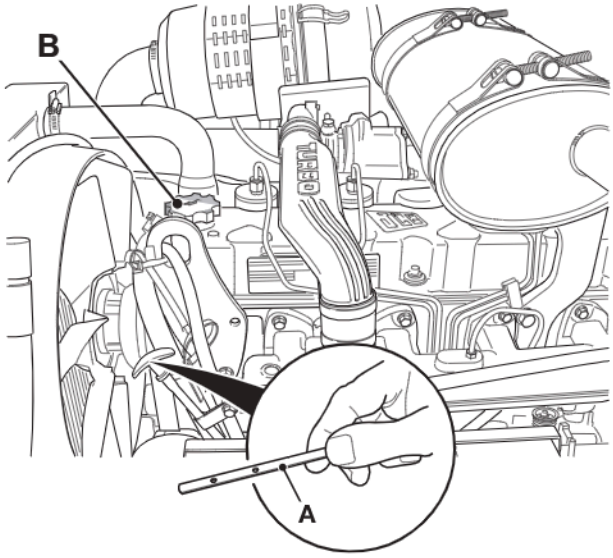


Fig 98.

Changing the Oil and Filter

T3-030_2

Drain the oil when the engine is warm as contaminants held in suspension will then be drained with the oil.

1 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

2 Place a container of suitable size beneath the sump drain plug **C**.

⚠ CAUTION

Oil will gush from the hole when the drain plug is removed. Hot oil and engine components can burn you. Keep to one side when you remove the plug.

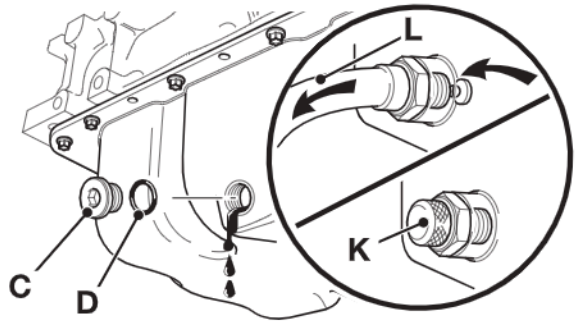
13-3-1-15

3 Drain the engine oil.

a Machine with a sump plug, remove the sump drain plug **C** and its 'O' ring **D**. Let the oil drain out, then clean and refit the drain plug with a new 'O' ring. Torque the drain plug to 40-60Nm (30-44lbf ft).

b Machines with a drain valve, remove the dust cap **K** from the sump drain port. Attach drain tube **L**. With the free end of the tube in an oil container, screw in the drain tube assembly to open the valve.

When all the oil has drained, unscrew the drain tube assembly and fit the dust cap **K**.



C012110-1

Fig 99.

4 Place a container of suitable size under drain plug **E** to catch the oil. ⇒ ***Fig 100. (135)***.

5 Loosen and remove the filter housing drain plug **E** and its 'O' ring **J**. Let the oil fully drain, then clean and refit the drain plug with a new 'O' ring. Torque the drain plug to 40-60Nm (30-44lbf ft).

6 Unscrew the filter canister **F**, use a chain wrench if necessary.

7 Clean the seal face of the filter head **G**.

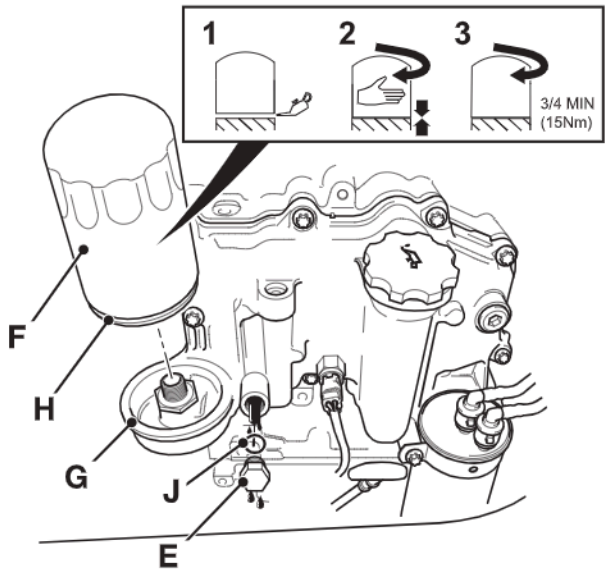
8 Smear the seal **H** on the new filter canister **F** with clean engine oil.

9 Screw the filter on until it just contacts the filter head.

10 Turn the filter at least a further 3/4 of a turn.

11 Through the top filler point, fill the engine with the recommended oil to the MAX mark on the dipstick. Refer to ***Checking the Oil Level***. Wipe off any spilt oil, refit the filler cap and make sure it is secure.

12 Operate the engine until the oil pressure low warning light has extinguished. Check for oil leakage. When the oil has cooled, check the oil level again, and if necessary top up with clean engine oil.



C012110-5

Fig 100.

Cooling System

Checking the Coolant Level

Visually check the coolant level daily.

Note: *Do not depend on the coolant level indicator to illuminate before adding coolant.*

Check the quality of the antifreeze mixture every year - before the cold weather starts. Change it every two years.

⚠ WARNING

The cooling system is pressurised when the coolant is hot. When you remove the cap, hot coolant can spray out and burn you. Make sure that the engine is cool before you work on the cooling system.

9-3-3-1_2

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

1 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

2 Carefully loosen the cap **B**. Let any pressure escape before removing the cap.

3 Observe the coolant fluid level at the radiator filler neck. If the coolant level is below the neck of the expansion tube **C** continue to steps 4, else continue to step 5.

4 Add pre-mixed water/antifreeze, via the radiator filler neck, until the coolant level reaches the neck of the expansion tube **C**.

5 Replace the radiator cap.

6 Run the engine for a while to raise the coolant to working temperature and pressure. Stop the engine and checks for leaks.

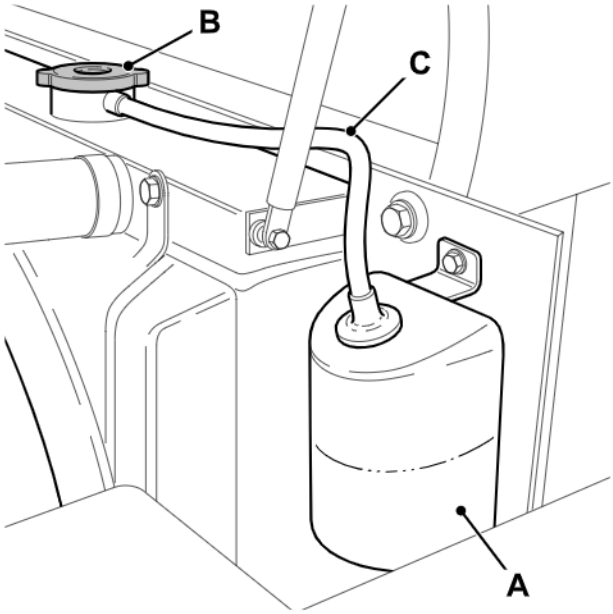


Fig 101.

Changing the Coolant

⚠ WARNING

The cooling system is pressurised when the coolant is hot. When you remove the cap, hot coolant can spray out and burn you. Make sure that the engine is cool before you work on the cooling system.

9-3-3-1_2

1 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

2 Carefully loosen cap **A** on the coolant reservoir, ⇨ ***Fig 101. (🗋 136)***. Let any pressure escape before removing the cap.

3 Place a container of suitable size beneath the radiator.

4 Disconnect the bottom hose from the radiator.

5 Flush the system using clean water. After flushing, reconnect the bottom hose to the radiator.

6 Use the necessary mix of clean, soft water and antifreeze. ⇨ ***Fluids, Lubricants and Capacities (🗋 99)***. Fill to the MIN level on coolant reservoir.

Note: *It is recommended that the cooling system be filled at a maximum rate of 10 litres per minute. If the fill rate is any higher than this there is a possibility of air becoming trapped in the system.*

7 Refit the filler cap. Make sure it is tight.

8 Run the engine for a while, to raise the coolant to working temperature and pressure.

Note: *Make sure the cab heater control is in the hot position. This will ensure the coolant mixture circulates through the entire cooling system.*

9 Stop the engine. Check for leaks. Check the coolant level and top up if necessary.

Front End Accessory Drive Belt

Introduction

The front end accessory drive belt (FEAD) drives the alternator, water pump and the air conditioning compressor (if fitted).

The belt is automatically kept in tension so will not need to be adjusted.

⚠ WARNING

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

2-3-3-5

⚠ WARNING

Turning the Engine

Do not try to turn the engine by pulling the fan or fan belt. This could cause injury or premature component failure.

0094

To get access to the drive belt for maintenance, open the engine cover. Refer to ***Access Panels, Engine Cover***.

Inspecting the Drive Belt

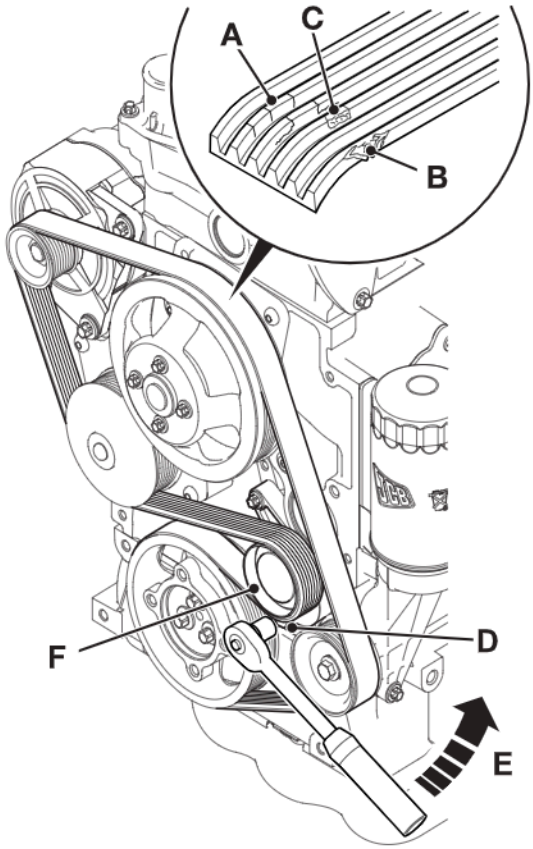
T3-029

At the recommended service interval, visually inspect the belt for damage.

1 Get access to the drive belt. Refer to ***Front End Accessory Drive Belt, Introduction***.

2 Inspect the belt for cracks **A**, fraying **B** or missing pieces **C**. ⇨ *Fig 102. (🗋 138)*.

Fit a new belt as required. Refer to ***Changing the Drive Belt***.



763440-2

Fig 102.

Changing the Drive Belt

1 Get access to the drive belt. Refer to ***Front End Accessory Drive Belt, Introduction***.

2 Use a 16mm (5/8 in.) socket located on the hexagon spigot nut **D**, carefully rotate the tensioner against the spring force in direction **E**. Do not use excessive force or the tensioner will be damaged.

3 Keep holding the tensioner against the spring force and lift the belt off the tensioner pulley **F**.

4 Slowly release the spring force by rotating the tensioner unit in the opposite direction.

5 Before fitting a new belt, check that the tensioner roller and fan pulley rotate smoothly and that there is no play in the bearings.

6 Fit the new drive belt around the pulleys. ⇨ ***Fig 102. (🗋 138)***.

7 Use a 16mm (5/8 in.) socket located on the hexagon spigot nut **D**, carefully rotate the tensioner against the spring force in direction **E**. Do not use excessive force or the tensioner will be damaged.

8 Keep holding the tensioner against the spring force and lift the belt around the tensioner pulley F.

Air Filter

Cleaning the Pre-Cleaner (if fitted)

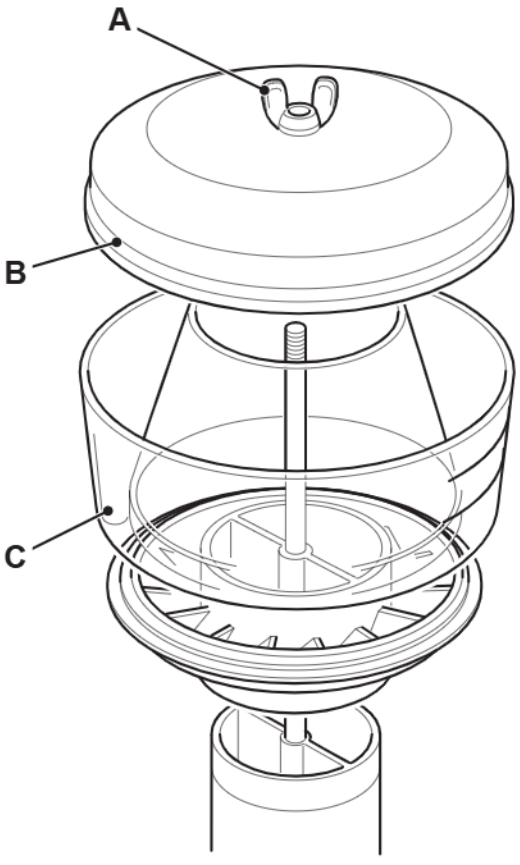
T3-015-2

Important: *Do not run the engine with the filter pre-cleaner removed. If the pre-cleaner is more than a third full of dust, empty it.*

1 Unscrew the wingnut **A** and lift off the cover **B**.

2 Carefully remove the dust bowl **C** and empty out the dust. Make sure the dust does not fall into the air filter intake. Wipe the bowl clean. Remove oil or grease by washing in hot water with a little detergent. Dry the bowl before refitting it.

3 Carefully set the bowl in position. Fit and tighten the wingnut **A**.



111320-1

Fig 103.

Cleaning the Air Filter Dust Valve

Important: *Do not run the engine with the dust valve **K** removed.*

Check the dust valve **K** is not blocked.

Inspect the rubber flaps for cuts and nicks and check that the rubber is not perished. Renew if necessary.

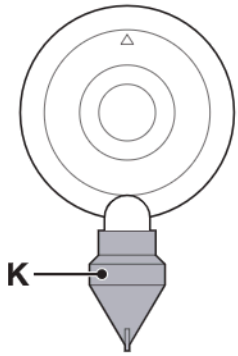


Fig 104.

Changing the Elements

⚠ CAUTION

The outer element must be renewed immediately if the warning light on the instrument panel illuminates.

2-3-3-1

⚠ CAUTION

Do not run the engine when the outer element has been removed.

16-3-3-1

Note: *Do not attempt to wash or clean the elements - they must only be renewed.*

Note: *Do not run the engine with the dust valve **K** removed.*

Note: *In a dusty environment, the outer element may have to be changed more frequently than the service schedule recommendation. A new inner element must be fitted at least every other time the outer element is changed. As a reminder, mark the inner element with a felt tipped pen each time the outer element is changed.*

1 Get access to the engine. Refer to ***Access Panels, Engine Cover***.

2 Clean the Pre-Cleaner (if fitted). ⇨ ***Cleaning the Pre-Cleaner (if fitted) (🗋 140)***.

3 Open clips **A** and lift off cover **B**. Remove outer element **C**. If the inner element is to be changed, remove inner element **D**.

Note: *Take care not to tap or knock the element. If necessary, release the springs on the filter bracket **L** to gain extra clearance when removing the filters.*

4 Clean the inside of cover **B** and canister **E**.

5 Carefully insert the new inner element **D** into the canister. Make sure it seats correctly by smearing seal **F** with grease and checking for a witness mark on the canister base.

6 Insert a new outer element into the canister. Make sure it seats correctly by smearing seal **G** with grease and checking for a witness mark on the canister base. Fit cover **B** with dust valve **K** at the bottom. Push the cover firmly into position and make sure it is secured by clips **A**.

7 If necessary, fasten the springs on the filter bracket **L**.

8 Check all hoses for condition and tightness.

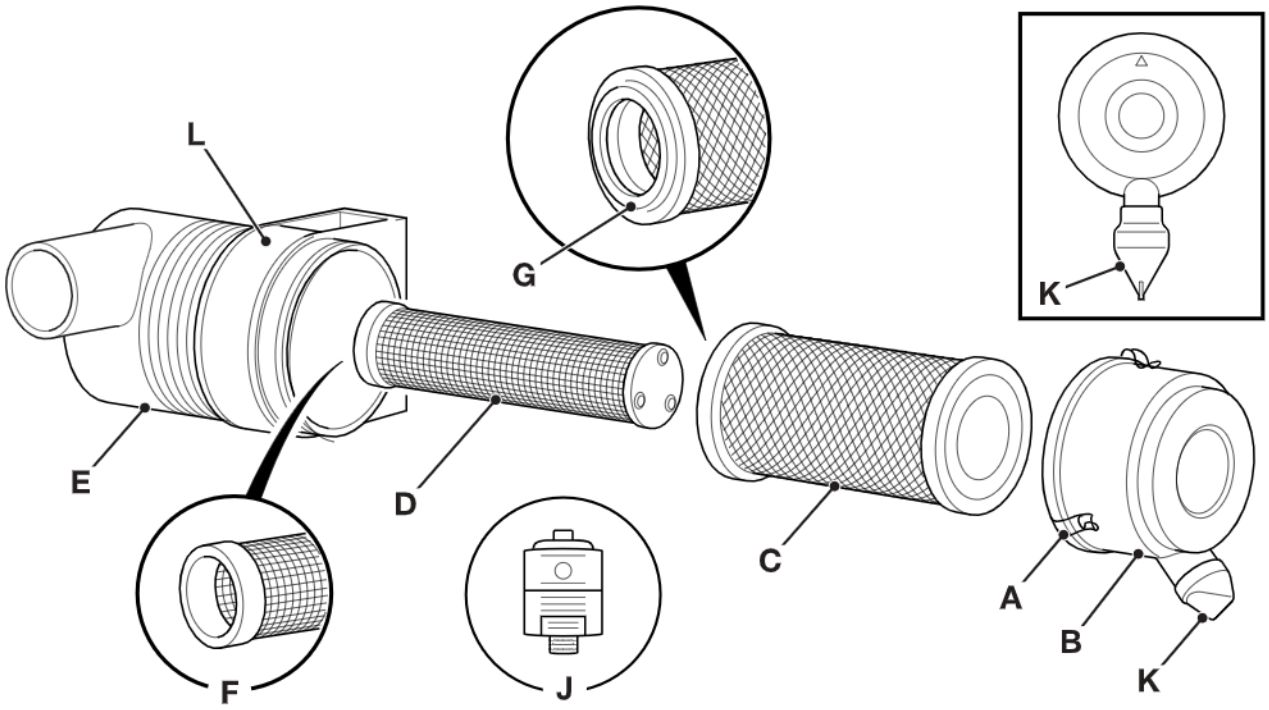


Fig 105.

Fuel System

Introduction

⚠ WARNING

Fuel

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

INT-3-2-2_3

⚠ WARNING

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of pressurised fluid and wear protective glasses. If fluid penetrates your skin, get medical help immediately.

0177

⚠ CAUTION

Do not allow dirt to enter the system. Before disconnecting any part of the system, thoroughly clean around the connection. When a component has been disconnected, always fit protective caps and plugs to prevent dirt ingress.

Failure to follow these instructions will lead to dirt entering the system. Dirt in the system will seriously damage the systems components and could be expensive to repair.

INT-3-3-12

⚠ CAUTION

Running the engine with air in the system could damage the fuel injection pump. After maintenance, the system must be bled to remove any air.

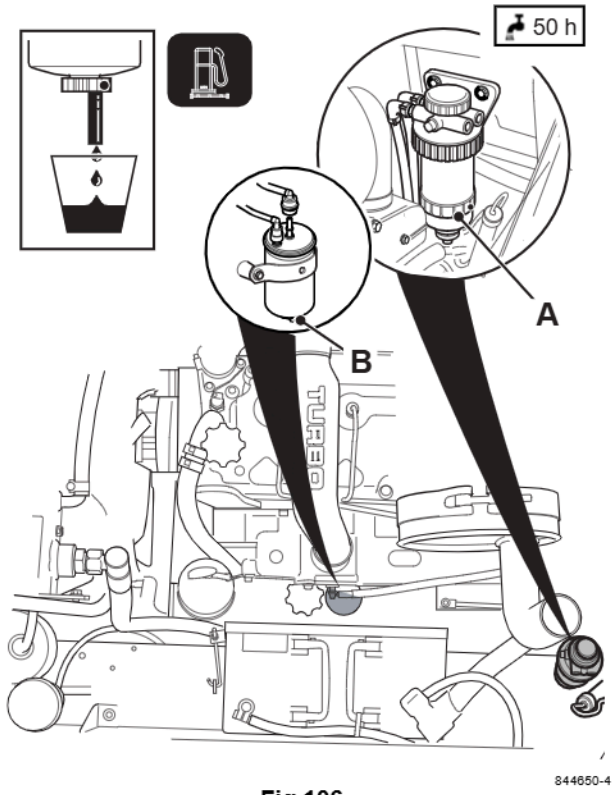
2-3-3-11

Water Separator and Engine Fuel Filter

Introduction

To get access to the water separator **A** and engine fuel filter **B** for maintenance:

1 Open the engine cover. Refer to ***Access Panels, Engine Cover***.



844650-4

Fig 106.

Draining the Water Separator and Engine Fuel Filter

If there is water in the fuel or if the cab warning light illuminates, drain the water separator and engine filter as detailed.

1 Get access to the Water Separator and Engine Fuel Filter. Refer to **Water Separator and Engine Fuel Filter, Introduction**.

2 Drain off any water in the element ***A*** by turning tap ***B***.

3 Drain off any water in the water separator bowl ***C*** by opening tap **D**. Do not disconnect the electrical connector ***E*** (if fitted).

4 If there is sediment in the bowl, after draining, support the bowl and release the locking ring **F**.

5 Wash the bowl in clean fuel.

6 Refit the bowl, secure in position with locking ring **F**.

Important: *Ensure the seal **D** is seated correctly before refitting the bowl.* ⇨ ***Changing the Water Separator Pre Filter (144)***.

7 Make sure that the fuel electrical connector ***E*** is correctly fitted. ⇨ ***Fig 108. (143)***.

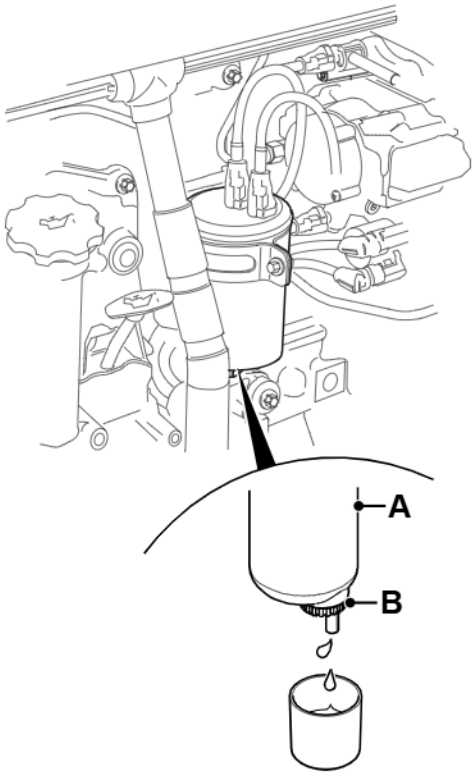


Fig 107.

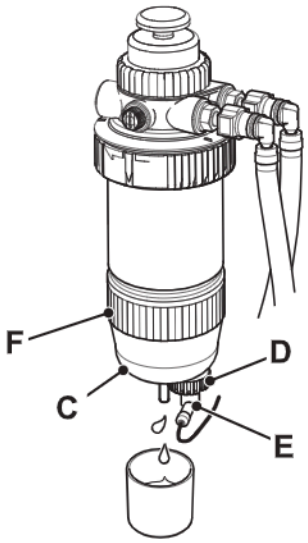


Fig 108.

Changing the Water Separator Pre Filter

1 Get access to the Water Separator and Engine Fuel Filter. Refer to **Water Separator and Engine Fuel Filter, Introduction**.

2 Drain and remove the water separator bowl ***C***. ⇨ *Draining the Water Separator and Engine Fuel Filter (143)*.

3 To remove the filter element ***A***, release locking ring **B** and discard element.

4 Fit new element and secure in position with locking ring **B**.

5 Refit water separator bowl. Secure in position with locking ring ***B***. ⇨ *Draining the Water Separator and Engine Fuel Filter (143)*.

6 Make sure that the fuel electrical connector ***E*** is correctly fitted. ⇨ *Fig 109. (144)*

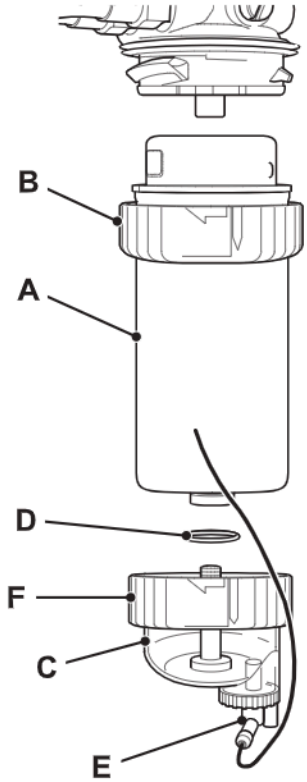


Fig 109.

Changing the Engine Fuel Filter Element

1 Get access to the Water Separator and Engine Fuel Filter. Refer to **Water Separator and Engine Fuel Filter, Introduction**.

2 Thoroughly clean the outside of the filter housing and around the filter head.

3 Loosen the drain tap **B** and allow the fuel to drain into a suitable container.

4 Remove the low pressure fuel lines ***C*** and ***E***. Mark the pipes prior to removal to ensure they are refitted in the correct position.

5 Loosen the filter strap retaining screw ***D*** and lift the filter clear.

6 Fit new filter element **A**, make sure that the filter is in the correct position to enable connection of the fuel lines. Torque tighten the filter strap retaining screw **D** to 24Nm (17.7lbf ft).

7 Reconnect the fuel lines **C** and **E**. ⇨ ***Fig 110. (🗋 145)***.

8 Bleed the fuel system. ⇨ ***Bleeding the Fuel System (🗋 146)***.

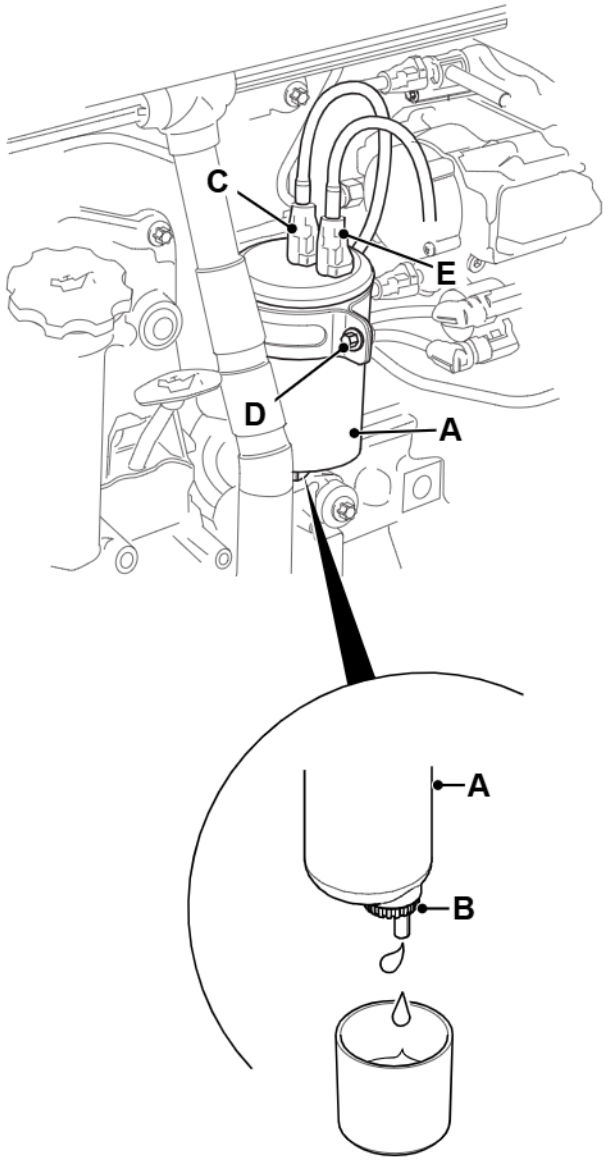


Fig 110.

Bleeding the Fuel System

To bleed the engine fuel filter **A** carry out the following:

1 Disconnect the fuel line **B** at the injection pump. ⇒ *Fig 111. (146)*.

2 Operate the fuel lift pump priming lever **C** until air free fuel exits from the fuel line. ⇒ *Fig 112. (146)*.

3 Reconnect fuel line **B**.

4 The engine is now ready to start. If the engine runs smoothly for a short time and then begins to run roughly, leave at idle until it runs smoothly.

If the engine continues to run roughly, check again for air in the fuel system.

If the fault persists contact your nearest JCB dealer.

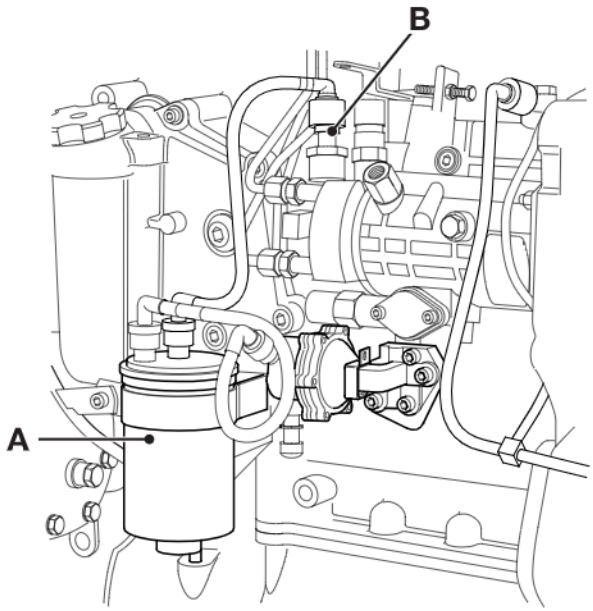


Fig 111.

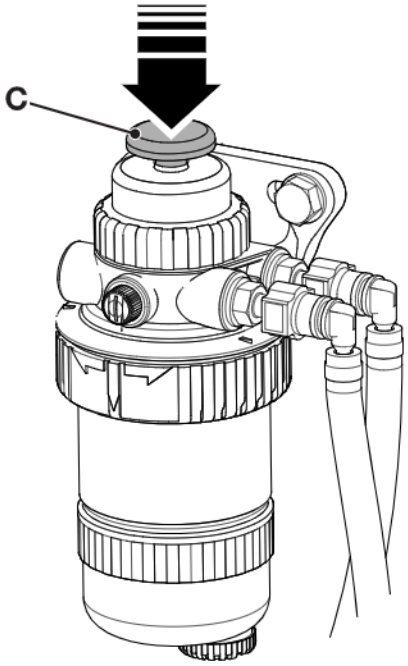


Fig 112.

Hydraulic System

Introduction

⚠ WARNING

The temperature of the hydraulic oil will be high soon after stopping the engine. Wait until it cools (less than 40°C) before beginning maintenance.

8-3-4-10

⚠ WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

⚠ CAUTION

Using incorrect fluid could damage the system. See Fluids, Capacities and Lubricants for the correct fluid. The fluid can harm your skin. Wear rubber gloves. Cover cuts or grazes.

2-3-5-1_2

⚠ CAUTION

Do not allow dirt to enter the system. Before disconnecting any part of the system, thoroughly clean around the connection. When a component has been disconnected, always fit protective caps and plugs to prevent dirt ingress.

Failure to follow these instructions will lead to dirt entering the system. Dirt in the system will seriously damage the systems components and could be expensive to repair.

INT-3-3-12

Releasing the Hydraulic Pressure

Important: *This procedure is only to be used before disconnecting the hydraulic hoses. Before removing any other hydraulic component refer to the relevant removal procedure.*

1 Make the machine safe with the mast lowered. Refer to ***Prepare the Machine for Maintenance***.

2 Operate the controls to remove the hydraulic pressure from the service hose lines.

a For manually operated services, operate the controls of the service to be disconnected.

b For electrical and servo operated services, turn the starter key to the ON position.

Operate the controls of the service to be disconnected.

Important: *To release the hydraulic pressure from the electrical and servo operated services the battery must be connected while you operate the controls.*

3 Clean the top of the tank around the filler cap **B**. Refer to ***Checking the Hydraulic Fluid Level.***

⚠ CAUTION

Allow the hydraulic fluid temperature to cool before removing the hydraulic tank filler cap. Open the cap slowly to prevent oil being forced out of the filler neck.

5-3-4-8

⚠ CAUTION

Do not run the engine with the hydraulic tank filler cap removed.

5-3-4-1

4 Slowly remove filler cap **B** to allow the system to vent fully and prevent oil being forced out of the filler neck.

Oil and Filter

Checking the Hydraulic Fluid Level

WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

1 Park the machine on level ground. Set forks on the ground. Stop the engine. Remove the starter key.

CAUTION

If the fluid is cloudy, then water or air has contaminated the system. This could damage the hydraulic pump. Contact your JCB Distributor immediately.

12-5-1-4

2 Look at the fluid level in the sight glass **A**. The level should be at the red mark (or above), but not over the sight glass.

CAUTION

Allow the hydraulic fluid temperature to cool before removing the hydraulic tank filler cap. Open the cap slowly to prevent oil being forced out of the filler neck.

5-3-4-8

CAUTION

Do not run the engine with the hydraulic tank filler cap removed.

5-3-4-1

3 If necessary, remove the filler cap **B**. Add recommended fluid through the filler.

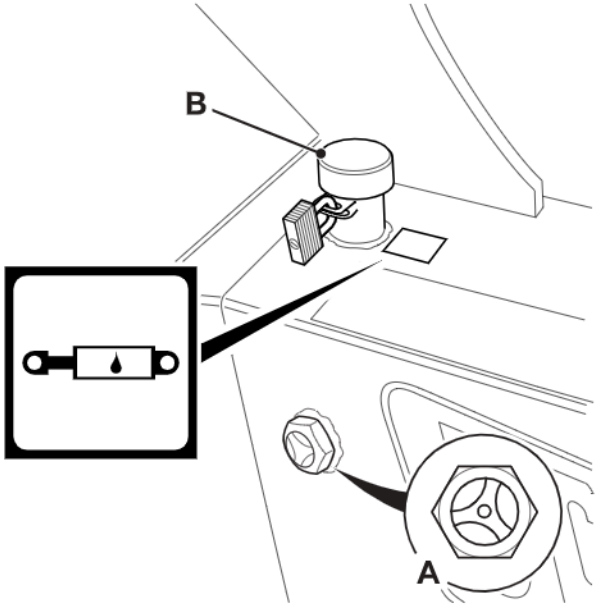


Fig 113.

Changing the Filter Element

⚠ WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

2 Vent the hydraulic system. **Refer to Releasing the Hydraulic pressure**.

3 Place a container of suitable size below the hydraulic filter to catch the oil.

4 From under the machine, unscrew and remove the element **A**. The element will contain hydraulic fluid; keep your face clear of spilling fluid.

5 Clean the mating faces on the new element and filter holder.

6 Smear the seal **B** with hydraulic fluid and screw the new element in place, hand-tight only.

7 Add recommended hydraulic fluid.

8 Replace the filler cap. Make the machine safe (See step 1), run the engine and check for leaks at the filter.

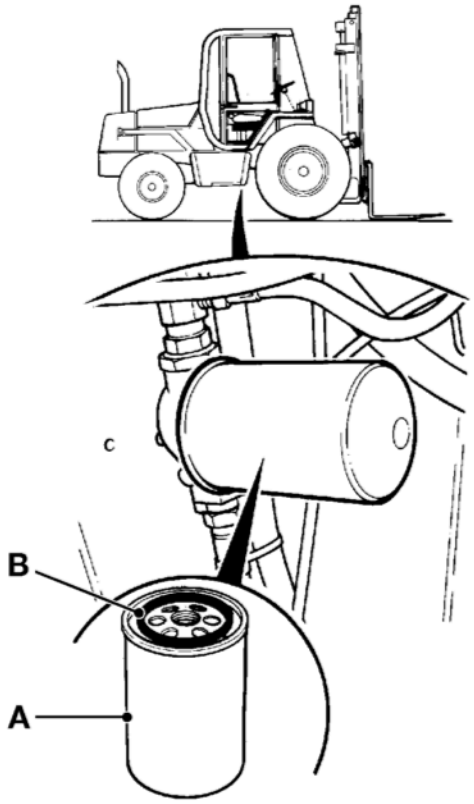


Fig 114.

Transmission

Gearbox

Checking the Transmission Oil Level

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

2 Start and run the engine slowly for a period not exceeding five minutes. This allows the oil to fill filter, pump, torque converter, oil cooler and hoses.

3 Switch OFF the engine and remove the starter key, wait one minute.

4 Open the engine cover. Refer to **Access Panels, Engine Cover**.

5 Check that the oil level is between the end of the dipstick and maximum mark on the dipstick **A**.

6 Add oil as necessary. Fill through the dipstick tube to maximum dipstick level. Use only the recommended oil.

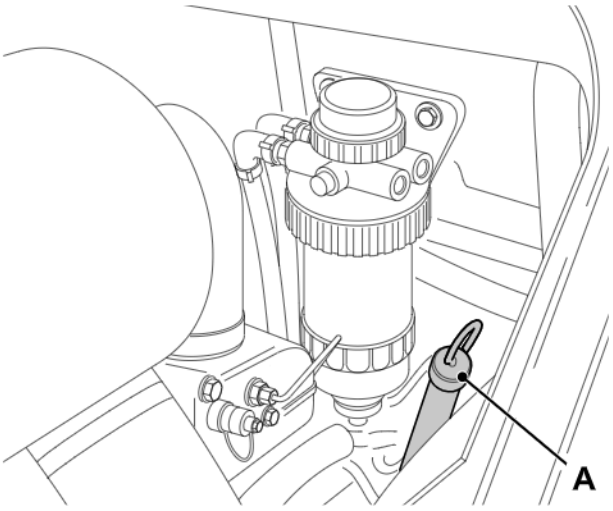


Fig 115.

Changing the Oil and Filter

The transmission oil should be drained through the suction strainer aperture to flush out any particles which fall off the strainer during its removal.

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Get access to the engine. Refer to **Access Panels, Engine Cover**.

2 Disconnect the battery.

⚠ CAUTION

When the strainer is removed, oil will gush out. Keep to one side when you remove the strainer.

2-3-4-1

3 Place a container, of suitable size beneath the suction strainer. Remove bolts **D**. Pull out the strainer **E** and its gasket **F**. Allow the oil to drain into the container. Be aware that the oil may be hot.

4 Clean the strainer with a suitable solvent. Follow the solvent manufacturer's instructions on safety.

5 Fit the strainer **E** and a new gasket **F**. Apply JCB Threadlocker and Sealer to bolts **D** before fitting and tightening them. Torque tighten the bolts to 10 Nm (7 lbf ft).

6 Unscrew and remove the filter **B**. Fit the new filter:

- **a** Smear seal **C** with transmission oil.
- **b** Screw the filter on until it just contacts the filter head.
- **c** Turn the filter at least another 3/4 of a turn.

7 Fill the system with new oil through the dipstick/filler. Do not fill past the top mark on the dipstick.

8 Run the engine for a while and let it cool. Check the oil level again.

Note: *Fit only a genuine supplied JCB filter, otherwise damage to the system may be incurred through contamination.*

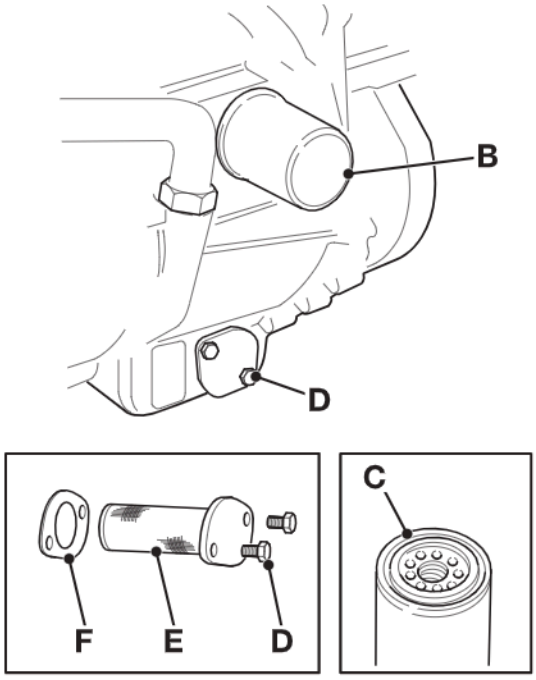


Fig 116.

Axles

Checking the Axle Oil Level

CAUTION

The oil level must be checked with the machine level, otherwise a false indication of the amount of oil will be given.

16-3-5-3_2

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

2 Clean the area around fill/level plug **A**, then remove the plug and its sealing washer. Oil should be level with the bottom of the hole. Add recommended oil if necessary.

3 Clean and refit the plug and its washer.

CAUTION

It is not recommended that the machine be driven with the axle partially filled with oil.

2-3-4-7

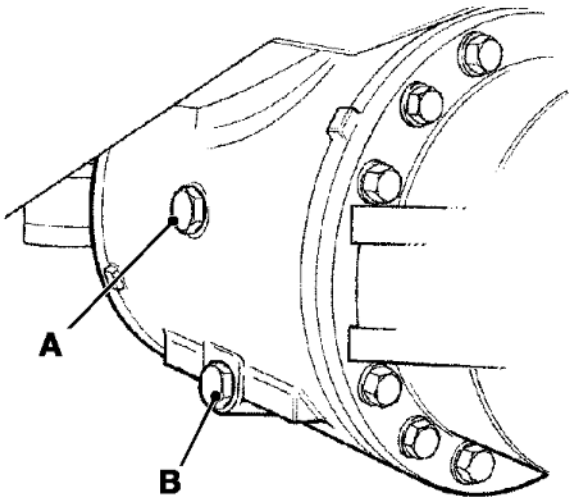


Fig 117.

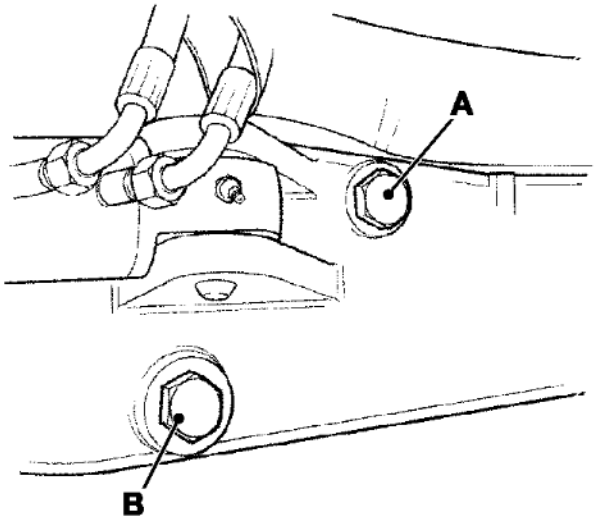


Fig 118.

Changing the Axle Oil

1 Make the machine safe with the mast lowered. Refer to **Prepare the Machine for Maintenance**.

2 Place a container of suitable size beneath plug **B** to catch the oil. Remove the drain plug **B** and its seal. Allow oil to drain out. The drain plug is magnetic. Wipe it clean. (Metallic particles should be carefully removed). Fit drain plug **B** and its washer.

⚠ CAUTION

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

2-3-4-2

3 Fill with recommended oil through fill/level hole **A**. Clean and refit plug **A** and its seal. Tighten to 79Nm (60lbf ft).

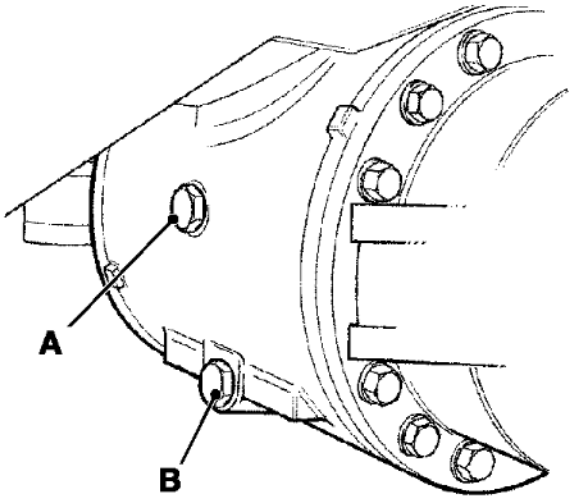


Fig 119.

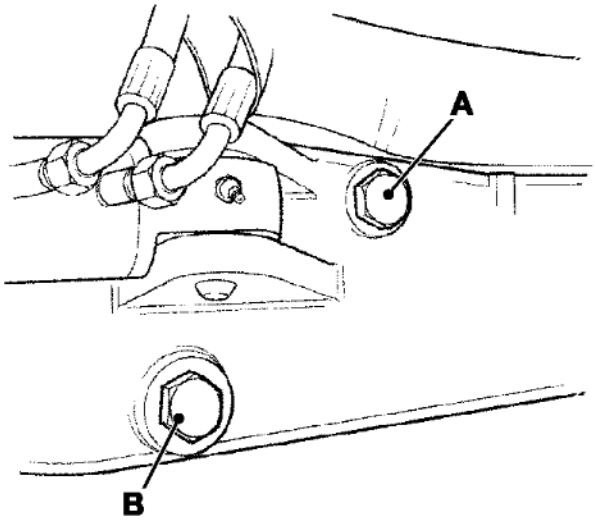


Fig 120.

Oil Immersed Brakes

The axle oil is used to lubricate the brake components, and to cool the brake plates.

It is important that the oil is changed regularly as specified in the service schedule - the lubricating properties of the oil will reduce as a result of brake wear.

Consult your JCB Distributor for advice if necessary.

Checking the Hub Oil Levels

T3-011_2

Check each hub separately.

1 Park the machine on level ground with the OIL LEVEL mark horizontal. There is a tolerance of 5 mm (0.2 in) above or below the horizontal.

2 Engage the park brake. Set the transmission to neutral. Lower the attachments to the ground. Stop the engine and remove the starter key.

3 Clean the area around the fill/level plug **121-C**. Remove the plug. Oil should be level with the bottom of the hole. If necessary, add the recommended oil. Clean the plug before refitting it.

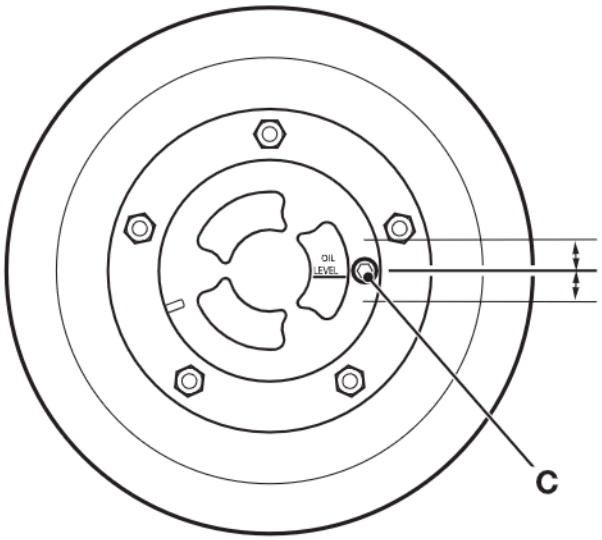


Fig 121.

Changing the Hub Oil

Change the oil in each hub separately

1 Set the machine level, with the wheels just clear of the ground. Manually rotate the wheels to bring the OIL LEVEL mark on the hubs to the vertical position, with the fill/level plugs **122-C** at the bottom.

2 Drain the oil:

a Place a container of suitable size beneath plug **122-C** to catch the oil.

⚠ CAUTION

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

2-3-4-2

b Remove fill/level plugs **122-C**. Allow time for the oil to drain out.

3 Set OIL LEVEL marks to the horizontal.

a Fill the hubs with recommended axle oil, through the fill/level holes **122-C**. Oil should be level with the bottom of the fill/level hole.

b Clean and refit fill/level plugs **122-C**.

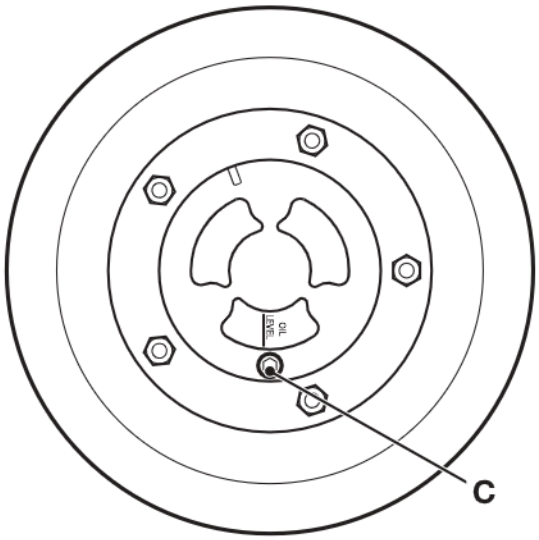


Fig 122.

Tyres and Wheels

Tyre Inflation

Introduction

T3-066

⚠ WARNING

An exploding tyre can kill. Inflated tyres can explode if over-heated or over-inflated. Follow the instructions given when inflating the tyres. Do not cut or weld the rims. Use a tyre/wheel specialist for all repair work.

2-3-2-7_2

⚠ WARNING

Wheels and tyres are heavy. Take care when lifting or moving them.

Store with care to ensure that they cannot fall and cause injury.

13-3-1-7_1

Always try to maintain your tyre pressure to the recommended settings. Using your machine with under-inflated tyres means:

- Decreasing the machines stability
- Higher tyre temperatures
- Excessive strain of the tyre fabric
- More bulging of the sidewalls
- Shortens the tyres life.

Using the machine with over inflated tyres is dangerous:

- It causes excessive tensile loads in the fabric: this makes a tyre more susceptible to cuts and punctures.

Do not cut or weld on the rim of an inflated tyre.

After checking or amending the tyre pressure always replace and secure the valve cap.

Always deflate the tyre before removing foreign obstacles from the tread.

Procedure

T3-067_2

These instructions are for adding air to a tyre which is already inflated. If the tyre has lost all its air pressure, call in a qualified tyre mechanic. The tyre mechanic should use a tyre inflation cage and the correct equipment to do the job.

1 Prepare the wheel.

Before you add air to the tyre, make sure it is correctly fitted on the machine or installed in a tyre inflation cage. ⇨ *Fig 123. (156)*.

2 Prepare the equipment.

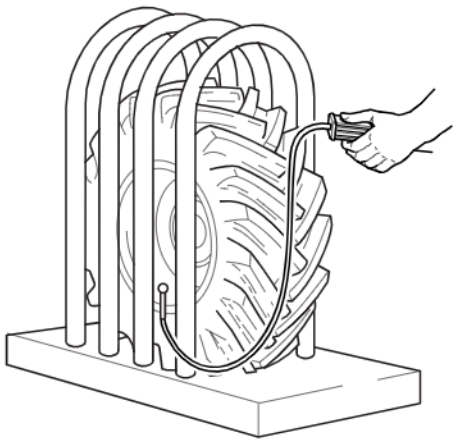
a Use only an air supply system which includes a pressure regulator. Set the regulator no higher than 1.38 bar (20 psi) above the recommended tyre pressure. For recommended tyres and pressures for your machine, see ***Specifications, Tyre Sizes and Pressures***.

b Use an air hose fitted with a self-locking air chuck and remote shut-off valve.

3 Add the air.

a Make sure that the air hose is correctly connected to the tyre valve. Clear other people from the area. Stand behind the tread of the tyre while adding the air.

b Inflate the tyre to the recommended pressure. Do not over-inflate.



A089570-1

Fig 123.

Changing a Wheel

⚠ WARNING

Deflate the tyre you wish to change before removing the wheel from the machine. Air pressure in the tyres can cause the tyre and rim sections to explode causing serious injury or death. Never loosen the nuts that hold the inner and outer wheel halves together when there is air pressure in the tyre. Always wear safety glasses.

12-6-1-3

⚠ WARNING

Whenever a wheel has been changed, check the nut torques every two hours. When the nuts stay tight for eight hours, the interval for checking can revert to the period stated in the servicing schedule.

12-6-1-4

Note: *If for whatever reason a wheel bolt is renewed, all the bolts for that wheel must be replaced as a set, since the remaining bolts may have been damaged.*

1 Remove the wheel as follows:

a Park the machine on firm level ground.

b Apply the park brake and select neutral.

c Stop the engine and remove the ignition key.

d Jack up the machine to gain access to whichever wheel you wish to change.

e Deflate the tyre and remove the valve core to make sure that all the air is out of the inner tube (pneumatic tyres only).

Note: *Push a wire through the valve stem to make sure the valve stem does not have a restriction.*

f Remove the nuts **A** then remove the wheel.

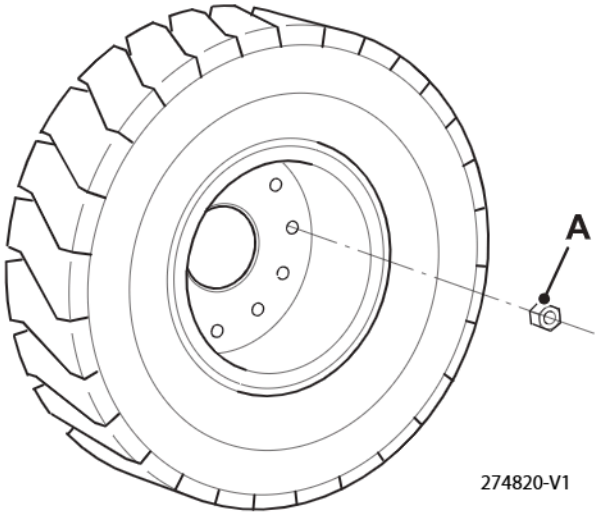


Fig 124.

2 Refit the wheel as follows:

a Inspect the wheel for any damage, i.e. elongated holes.

b Clean the hub, wheel mounting face and nut cones thoroughly if they are contaminated with paint, rust or debris.

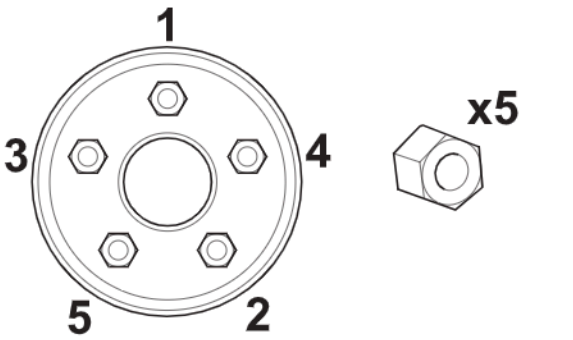
c Ensure the wheel stud thread surface is maintained dry and is free from all lubricants.

d Position the wheel on the hub.

e Lightly tighten the nuts **A** to ensure the wheel is correctly seated onto the hub.

f Tighten the nuts **A** diametrically in pairs. ⇨ ***Checking the Wheel Nut Torques (158)***.

g Lower the machine to the ground.



732160-V2

Fig 125.

Checking the Wheel Nut Torques

T3-014_3

⚠ WARNING

If, for whatever reason, a wheel stud is renewed, all the studs for that wheel must be changed as a set, since the remaining studs may have been damaged.

2-3-2-8

On new machines, and whenever a wheel has been removed, check the wheel nut torques every two hours until they stay correct.

Every day, before starting work, check that the wheel nuts are tight.

Tighten the wheel nuts (in a diagonal sequence) to the torque value shown.

Table 6.

Front	Rear
Nm (lbf ft)	**Nm (lbf ft)**
680 (500)	680 (500)

Forks

Inspecting the Forks

⚠ WARNING

Do not try to correct the alignment of the fork tips by bending the forks or adding shims. Never repair damaged forks by heating or welding. Forks are made of special steel using special procedures. Always replace damaged forks.

12-5-1-6

1 Park the machine on level, solid ground.

2 Make sure the park brake is engaged and select neutral.

3 Raise the forks to allow inspection.

4 Stop the engine and remove the key.

5 Inspect the forks as follows:

- **a** Make sure there are no cracks or obvious damage such as twisting or bending.
- **b** Inspect the heel of the forks for wear. Wear must not exceed 10% of the fork thickness.
- **c** Check that the fork tips are aligned. Tip alignment must be within 3% of the fork length.
- **d** Check the angle of the fork upright to the fork plate. The angle must not exceed 93 degrees.

Changing the Forks

⚠ WARNING

The forks are heavy. Make sure suitable lifting equipment is used to support and transport them.

12-5-1-7_2

1 Park the machine on level, solid ground.

2 Apply the park brake and select neutral.

3 Depending on the fork type fitted, remove each type of fork as follows:

Industrial Carriage Forks

Note: *The locking clamp **X** is only required when the individual fork width is less than 125mm (5in). Contact your JCB dealer to procure and install a locking clamp if required.*

Removal

1 If installed, remove the locking clamp **X** from the bottom of the carriage. ⇨ *Fig 126. (159)*

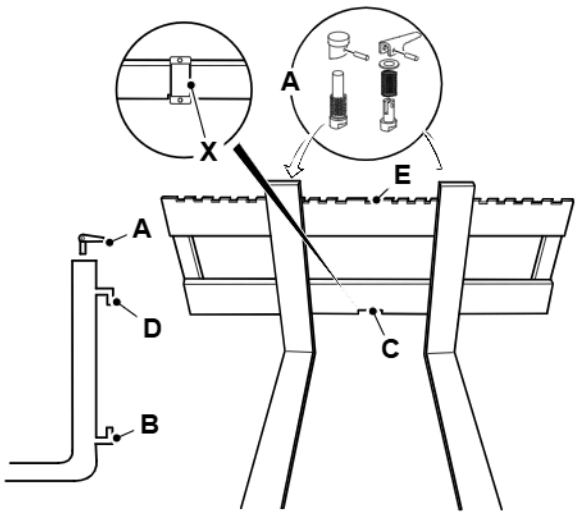
2 Release locking pins **A** and slide the fork to the centre of the carriage so it is level with the bottom removal notch **C.** ⇨ *Fig 126. (159)*

Note: *Your machine will have either twist and pull or pull type fork locking pins.* ⇨ *Fig 126. (159)*

3 Lower the forks onto blocks so that the bottom hook **B** disengages from the bottom removal notch **C.** ⇨ *Fig 126. (159)*

4 Lower the carriage further so that the upper hook **D** disengages from the top of the carriage **E.** ⇨ *Fig 126. (159)*

5 Move the carriage away from the forks or support and remove the forks using suitable lifting equipment.



T069860-1

Fig 126.

Installation

Note: *Make sure that you install the correct type of fork for the type of carriage fitted. Do not attempt to fit the incorrect forks.*

1 Park the machine on solid level ground. Make sure the park brake is engaged and select neutral.

2 Position the fork so that the upper hook **D** can engage the top of the carriage **E**. ⇨ *Fig 126. (159)*

3 Raise the carriage to locate the bottom hook **B** in the lower removal notch **C**. ⇨ *Fig 126. (159)*

4 Make sure each fork has engaged the carriage at the top and bottom positions. Slide each fork along the carriage, away from the lower removal notch **C**. ⇨ *Fig 126. (159)*

⚠ WARNING

If the fork/locking pin is not fully engaged, the fork could become unintentionally disengeged.

12-6-1-13

5 Re-engage locking pins **A** into the required notches.

6 Install the locking clamp **X** onto the bottom of the carriage. ⇨ *Fig 126. (159)*.

⇨ *Industrial Carriage Fork Adjustment (66)*

Important: *The locking clamp must be fastened to the carriage at all times during machine operation.*

Bar Carriage Forks

Removal

1 Remove the location pins **A**. ⇨ *Fig 127. (160)*

2 Release the retaining clips **G** from the bar securing pins and remove the bar **H** from the carriage. ⇨ *Fig 127. (160)*

3 Using suitable lifting equipment, support the fork and slide it to the end of the carriage.

4 Use the lifting equipment, remove the fork from the carriage.

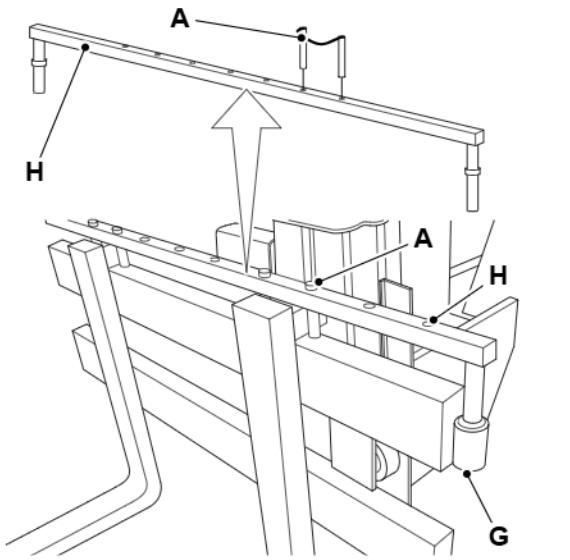


Fig 127. Bar Type Carriage

Installation

Note: *Make sure that you install the correct type of fork for the type of carriage fitted. Do not attempt to fit the incorrect forks.*

1 Park the machine on solid level ground. Make sure the park brake is engaged and select neutral.

2 Position the fork so that the upper hook **D** and bottom hook **D** can engage the end of the carriage. ⇨ *Fig 126. (159)*

3 Using the lifting equipment, support the fork and slide it along the carriage.

4 Install the bar **H** onto the top of the carriage and secure into position with retaining clips **G**. ⇨ *Fig 127. (160)*

5 Make sure that each fork has engaged the carriage correctly at the top and bottom positions.

6 Refit the two pairs of retaining pins **A** using one pair for each fork. Make sure that each pin drops freely into place and that each pair of pins is positioned as shown. ⇨ *Fig 127. (160)*.

⇨ *Bar Carriage Fork Adjustment (66)*

Windscreen Washer

Checking the Level

Fill the windscreen washer bottle **A** with a suitable liquid. The liquid should contain a de-icing fluid to prevent freezing. Do not use engine coolant antifreeze.

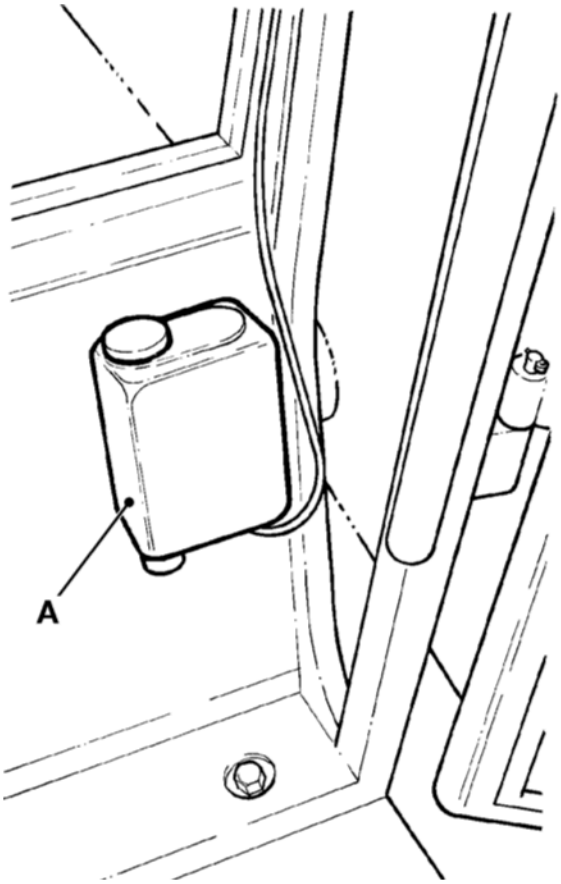


Fig 128.

Fire Extinguisher (if fitted)

T3-022

Checking the Fire Extinguisher

Check the fire extinguisher for damage, security and signs of leaking.

Check that the gauge **A** indicates that the extinguisher is charged i.e. the needle is in the GREEN segment.

Note: *If the needle is in or very near the RED segment at either end of the gauge, the extinguisher must be serviced or replaced.*

Make sure the safety pin **B** is fitted and secure.

The extinguisher should be serviced every 12 months by a suitably qualified person.

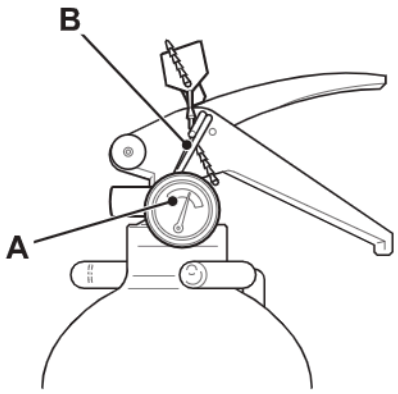


Fig 129.

Optional Attachments

Introduction

T4-002_3

⚠ WARNING

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

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

2-4-5-2_1

⚠ CAUTION

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

5-5-1-1_2

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

This part of the manual includes general information on attachment operation and instructions for installation and removal of attachments.

Some attachments are supplied complete with instructions on safety, installing and removing, operation and maintenance. Read and fully understand the information before fitting, using and servicing the attachment. If there is anything you do not understand, ask your JCB Distributor.

Before using any attachment, read again ***Working With The Machine*** in the Operation section and 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.

Practice using attachments off the job before working with them for the first time.

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

If your machine needs the hydraulic system adapting to facilitate the use of auxiliary attachments, you must consult your distributor. Only suitably qualified personnel must re-route hydraulic hoses.

All optional attachments will have limits on their operation. i.e. lifting capacity, speeds, hydraulic flow rates, etc. Always check in the literature supplied with the attachment or in the Specification section of this manual. Some specification limits may also be displayed on the attachments Data/Rating Plate.

⚠ CAUTION

Some attachments may contact parts of the machine when in the fully folded position. Take extra care to avoid damage to the machine.

3-4-1-4

Attachments For Your Machine

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

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

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

Connecting/Disconnecting Hydraulic Hoses

T4-004_2

Introduction

⚠ WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

Some attachments are hydraulically powered. The following procedures show how to connect and disconnect the hydraulic hoses safely.

Connecting the Hydraulic Hoses

1 Make the machine safe. Refer to ***Routine Maintenance, Prepare the Machine for Maintenance***.

2 Vent the hydraulic system. Refer to ***Routine Maintenance, Releasing the Hydraulic Pressure***.

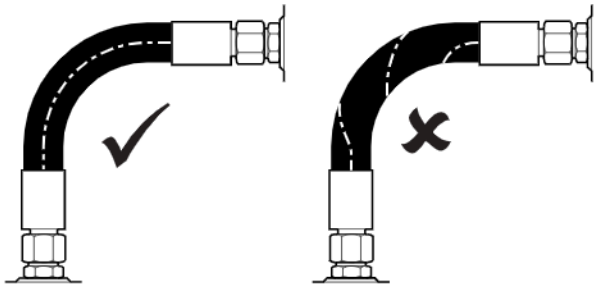
3 If necessary, remove the blanking caps.

4 Check the hoses and adaptors for damage. Refer to ***Routine Maintenance, Checking for Damage***.

5 Connect the hoses.

If the hoses have quick releases couplings, refer to ***Quick Release Couplings***.

a Make sure that the hose is not twisted. Pressure applied to a twisted hose can cause the hose to fail or the connections to loosen.



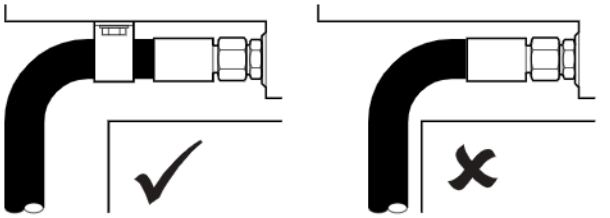
T037400

Fig 130.

b Make sure that the hose does not touch hot parts. High ambient temperatures can cause the hose to fail.

c Make sure that the hose does not touch parts which can rub or cause abrasion.

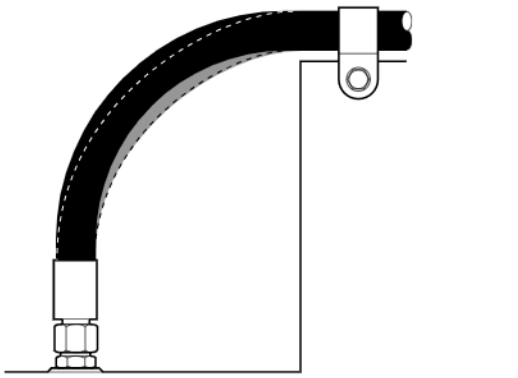
d Use the hose clamps (where possible) to support long hose runs and keep the hoses away from moving parts, etc.



T037420

Fig 131.

To allow for length changes when the hose is pressurised, do not clamp at the bend. The curve absorbs the change.



T037410

Fig 132.

6 Check for leaks.

a Start the engine.

b Operate the related control to increase the pressure in the hydraulic system.

c Stop the engine then remove the starter key.

d Check for indications of leakage at the hose connections. Correct, as necessary.

Disconnecting the Hydraulic Hoses

1 Make the machine safe. Refer to ***Routine Maintenance, Prepare the Machine for Maintenance***.

2 Vent the hydraulic system. Refer to ***Routine Maintenance, Releasing the Hydraulic Pressure***.

3 Disconnect the hoses.

If the hoses have quick releases couplings, then refer to ***Quick Release Couplings***.

4 Check the hoses and adaptors for damage. Refer to ***Routine Maintenance, Checking for Damage***.

5 If necessary, install the blanking caps

6 Check for leaks.

a Start the engine.

b Operate the related control to increase the pressure in the hydraulic system.

c Stop the engine then remove the starter key.

d Check for indications of leakage at the hose connections. Correct, as necessary.

Quick Release Couplings

⚠ WARNING

The external surfaces of the couplings must be clean before connecting or disconnecting. Ingress of dirt will cause fluid leaks and difficulty in connecting or disconnecting. You could be killed or seriously injured by faulty Quick Release Couplings.

2-4-1-15

Flat face quick release couplings allow the operator to remove and install attachments swiftly and efficiently. Generally, your machine pipework will be fitted with a female coupling **A** and a male coupling **B**. The optional attachment hoses will also be fitted with a female coupling **A** and a male coupling **B**. ⇨ *Fig 133. (🗋 168)*.

The quick release couplings should be trouble free and relatively easy to connect and disconnect, provided they are kept clean and used correctly. The recommendations listed below should always apply when using flat face quick release couplings.

Finally, please read the correct fitting and releasing procedures before you install or remove any optional attachment fitted with quick release couplings.

Essential Do's

- Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses.
- Always wipe the two mating faces clean before connecting.
- Use caps and plugs when the couplings are disconnected.
- Always align the external locking ball (if used) with the notch in the locking sleeve and then pull the locking sleeve back fully to disconnect.
- If a coupling sticks, first check that pressure has been released. Ensure the locking ball and notch in the locking sleeve are aligned, pull back the sleeve and twist the couplings apart. Sticking is normally caused by dirt in the coupling or physical damage due to abuse.
- Connect and disconnect new couplings two or three times to work the PTFE seals. Sometimes a new coupling will stick if the seal has not been worked.
- When fitting couplings, only apply the spanner or grips to the hexagon and nowhere else.
- Avoid damage to the coupling faces. Burrs and scratches cause damage to the seals and cause leaks. They can also impede connection and disconnection of the couplings.
- Periodically lubricate the internal locking balls on the female half of the coupling with silicone grease.

Essential Don'ts

- Never attempt to reconnect using a damaged half coupling as this will destroy the seals in the mating half and necessitate replacement of both halves.
- Do not leave the coupling where it may be run over by a vehicle or otherwise crushed - this will distort the sleeve and prevent connection and disconnection.
- Never try to turn the sleeve when the coupling is disconnected since this will cause the locking ball to jam under the locking sleeve and damage the coupling.
- Never try to strip the coupling down, there are no user serviceable parts. If the coupling is damaged it should be replaced with a new one. See coupling guides for a reference.
- Never hit the centre poppet of the coupling to try and release locked in pressure. This can cause irreparable damage to the coupling and serious injury.
- When fitting couplings, never clamp on the sleeve of the female or nose of the male - this will cause distortion and/or damage.
- Never subject the couplings to external forces, especially side load. This can reduce the life of the coupling or cause failure.
- Never allow the torsional forces transmitted from hoses to unscrew/screw together couplings.
- Never use a coupling as a plug.
- Do not connect and disconnect with pressure in the line unless the coupling type is specifically designed to do so.

Connecting Quick Release Couplings

1 Remove any residual hydraulic pressure trapped in the service line hose.

2 Wipe the two faces of the male and female couplings and make sure they are clean.

3 Make sure that ball **C** in the female coupling is located in one of its slots.

4 Fit the male coupling into the female coupling.

5 Where applicable, rotate sleeve **E** half a turn and make sure that the locking ball **C** does not align with the slot **D**.

Disconnecting Quick Release Couplings

1 Remove any residual hydraulic pressure trapped in the service line hose.

2 Where applicable, align the slot **D** with ball **C**.

3 Pull back sleeve **E** to release the coupling.

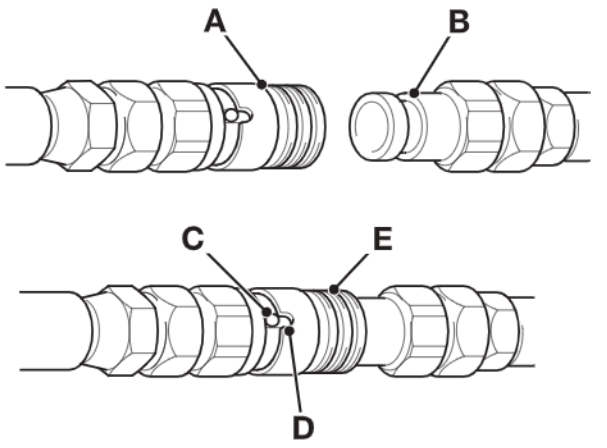


Fig 133.

Work Platforms

P5-4006_3

⚠ 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

The use of work platforms with this machine is subject to legislation which varies from territory to territory. It is the responsibility of the owner/operator and supplier of the work platform to ensure compliance with the relevant legislation in the relevant territory. In the case of uncertainty, guidance should be sought from the relevant local or government authority.

JCB supply integrated work platforms solely for use in Europe which comply with the requirements of European Directive 2006/42/EC. Contact your dealer for further details. Health and safety legislation also varies from territory to territory. Customers should check the latest health and safety legislation for the territory in which the work platform is to be used prior to operation.

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Specifications

Static Dimensions

All Models

Note: *Dimensions relative to standard fork size 1067 x 100 x 50mm (42 x 4 x 2in) and tyres.*

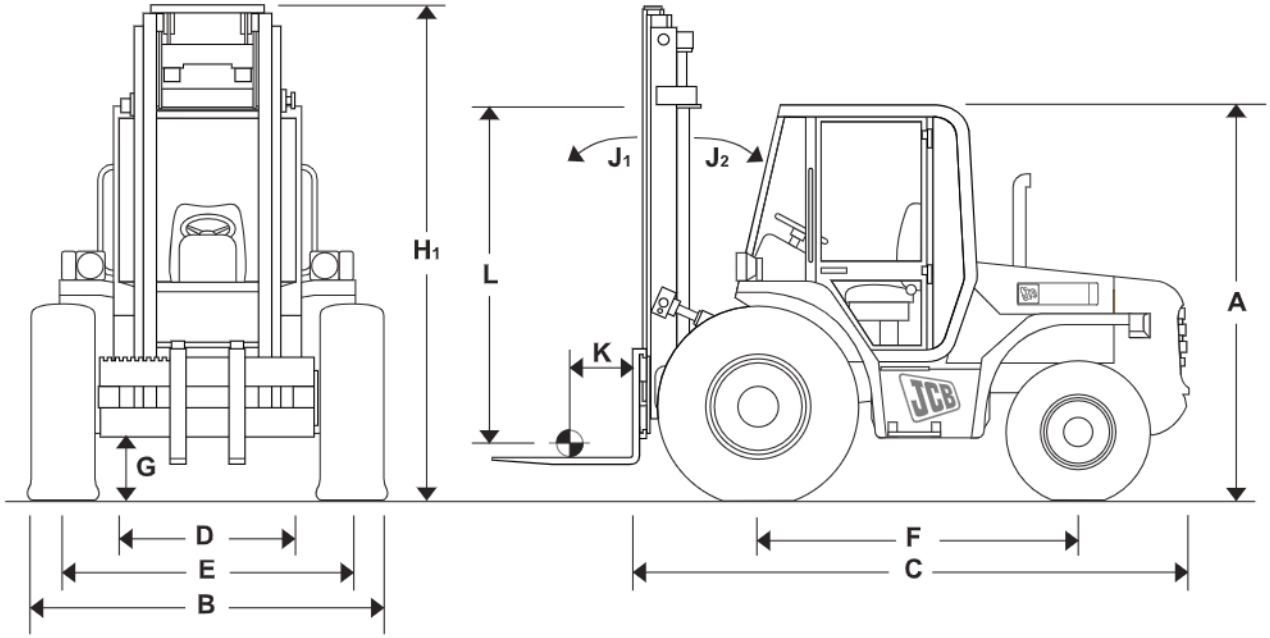


Fig 134.

Table 7.

		926	930	940	950
		mm (ft-in)	mm (ft-in)	mm (ft-in)	mm (ft-in)
A	Overall cab height	2570 (8-5)	2570 (8-5)	2570 (8-5)	2570 (8-5)
B	Overall width (over tyres)[1]	2200 (7-3)	2200 (7-3)	2200 (7-3)	2200 (7-3)
C	Overall length to front of carriage[2]	3600 (11-10)	3600 (11-10)	3580 (11-9)	3840 (12-6)
D	Inside width of cab	1160 (3-10)	1160 (3-10)	1160 (3-10)	1160 (3-10)
E	Front track	1800 (5-11)	1800 (5-11)	1800 (5-11)	2210 (7-4)
F	Wheel base (2 and 4 Wheel Drive)	2100 (6-11)	2100 (6-11)	2210 (7-4)	2210 (7-4)
G	Ground clearance	370 (1-2)	370 (1-2)	370 (1-2)	300 (1-0)

		926	930	940	950
		mm (ft-in)	mm (ft-in)	mm (ft-in)	mm (ft-in)
H 1	Mast Closed Height				
	3.6 m mast	2950 (9-8)	2950 (9-8)	2850 (9-4)(3)	NA
	4.5 m mast	2410 (7-10)	2410 (7-10)	2540 (8-4)(4)	NA
	5.5 m mast	2950 (9-8)	2950 (9-8)	2850 (9-4)(5)	3320 (10-8)(5)
	6.55 m mast	3320 (10-11)	3320 (10-11)	NA	NA
	6.7 m mast	NA	NA	3250 (10-8)(5)	NA
H 2	Mast Open Height				
	3.6 m mast	4780 (15-8)	4780 (15-8)	4840 (15-10)(3)	NA
	4.5 m mast	5410 (17-9)	5410 (17-9)	5810 (19-1)(4)	NA
	5.5 m mast	6610 (21-8)	6610 (21-8)	6730 (22-1)(5)	7660 (25-2)(5)
	6.55 m mast	7670 (25-2)	7670 (25-2)	NA	NA
	6.7 m mast	NA	NA	7840 (25-9)(5)	NA
J 1	Mast Tilt Forwards	18°	18°	10°	22°
J 2	Mast Tilt Backwards	10°	10°	10°	10°
K	Load Centre	500 (1-8)	500 (1-8)	500 (1-8)	600 (2-0)
L	Free lift (4.5 m mast only)	1460 (4-10)	1460 (4-10)	NA	NA
	Outside turn radius	4490 (14-8)	4490 (14-8)	4490 (14-8)	4490 (14-8)
	Departure angle	53°	43°	43°	43°
	Obstruction angle	51°	51°	51°	40°

(1) Dependant upon tyre specified.
(2) Industrial or bar.
(3) Duplex mast.
(4) Triplex mast (with Freelift).
(5) Triplex mast

Table 8. Machine Weights (Unladen)

926	930	940	950
kg (lb.)	**kg (lb.)**	**kg (lb.)**	**kg (lb.)**
5910 (13025)	6340 (13973)	6360 (13990)	8460 (18650)

Performance Dimensions

Lift Performance

926

Note: *Complies with ISO 22915-13.*

Important: *The following data is intended for quick reference only. Always refer to the rating plate in the cab.* ***Refer to Fork Ratings, Working with the Machine, Operation****.*

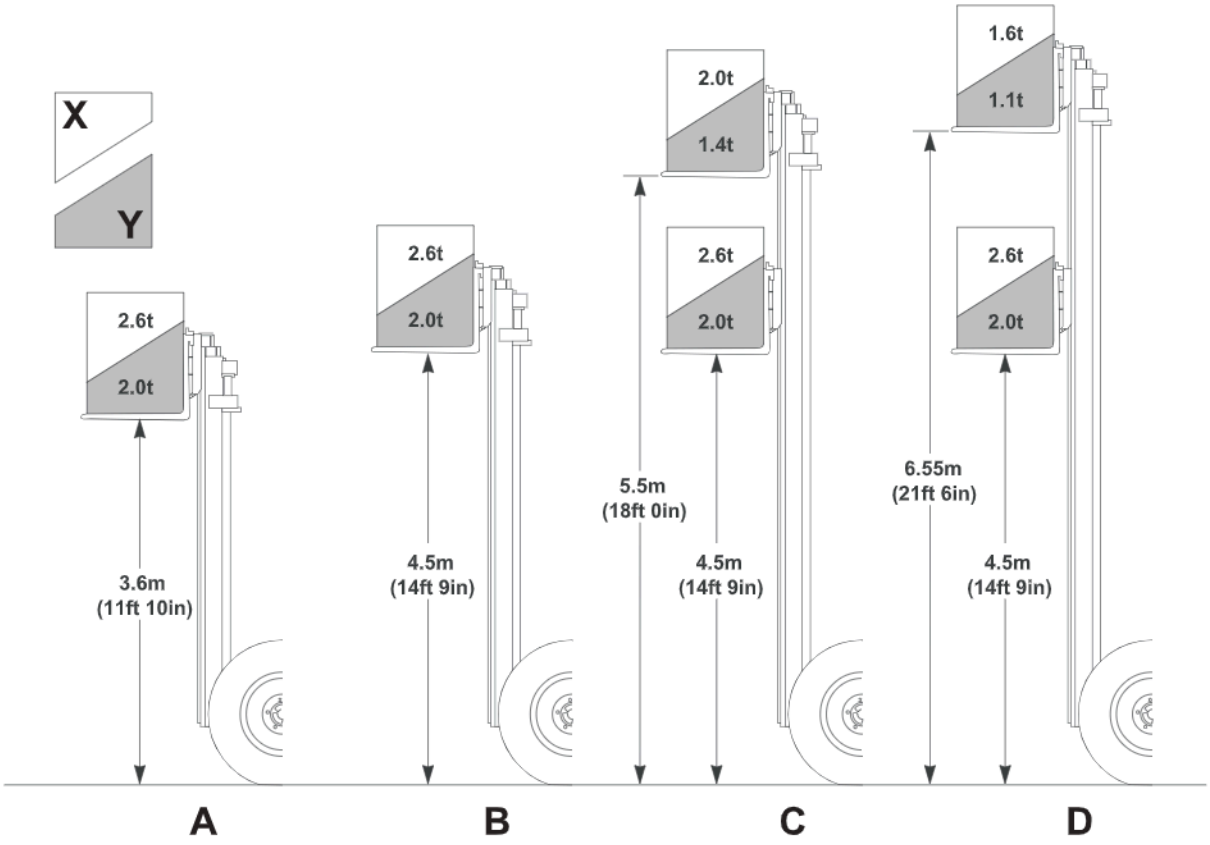


Fig 135. Lift Performance

A 3.6m (11ft 10in) Duplex mast
B 4.5m (14ft 9in) Free lift mast
C 5.5m (18ft 0in) Triplex mast
D 6.55m (21ft 6in) Triplex
X Bar and Industrial carriage
Y Multi-hitch carriage forkframe and forks

930

Note: *Complies with ISO 22915-13.*

Important: *The following data is intended for quick reference only. Always refer to the rating plate in the cab.* ***Refer to Fork Ratings, Working with the Machine, Operation****.*

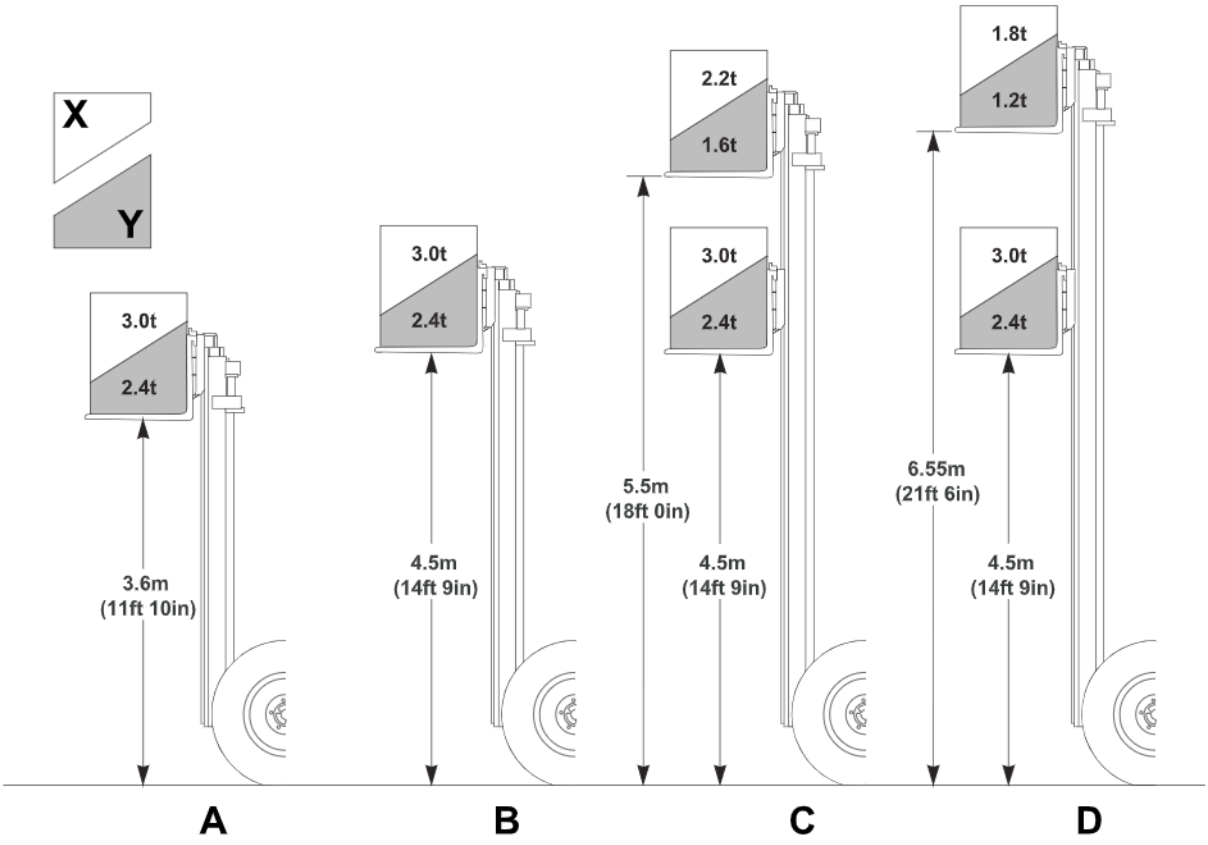


Fig 136. Lift Performance

A 3.6m (11ft 10in) Duplex mast

B 4.5m (14ft 9in) Free lift mast

C 5.5m (18ft 0in) Triplex mast

D 6.55m (21ft 6in) Triplex

X Bar and Industrial carriage

Y Multi-hitch carriage forkframe and forks

940

Note: *Complies with ISO 22915-13.*

Important: *The following data is intended for quick reference only. Always refer to the rating plate in the cab.* ***Refer to Fork Ratings, Working with the Machine, Operation****.*

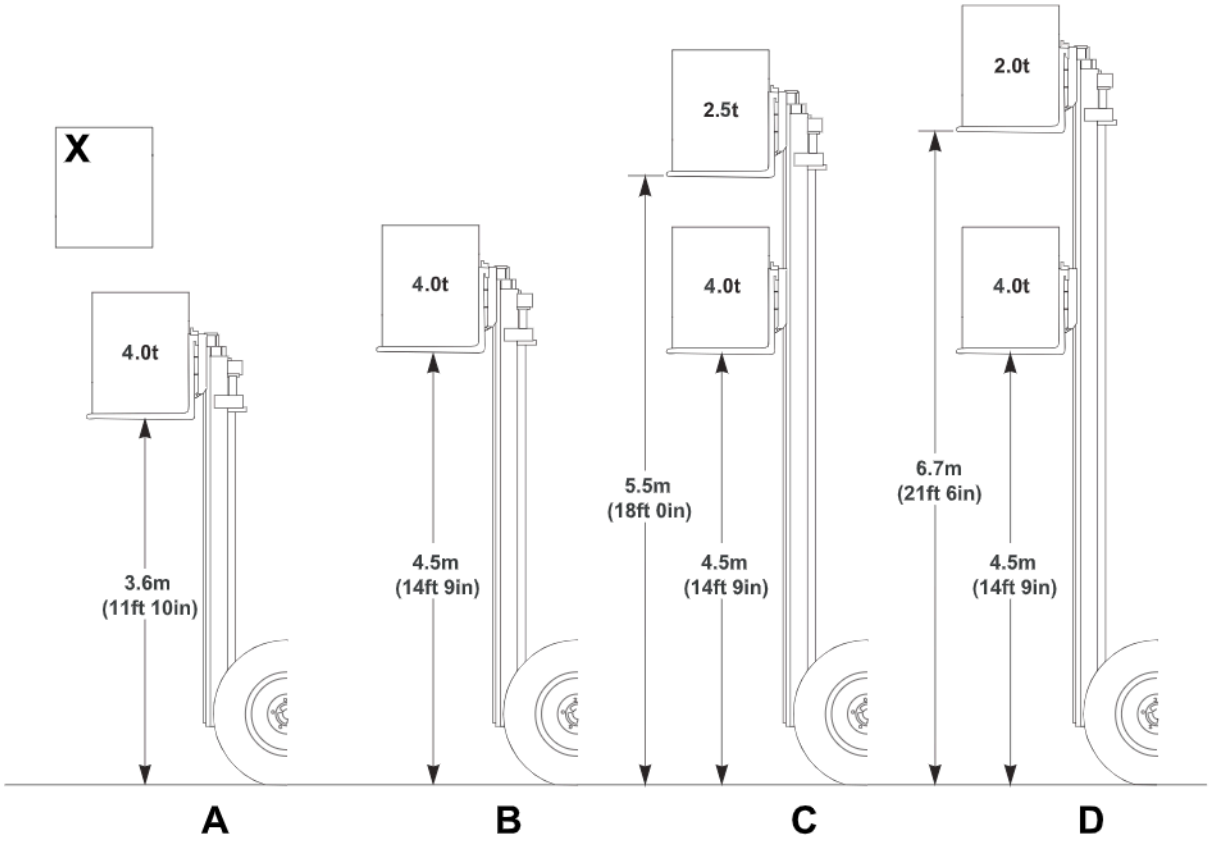


Fig 137. Lift Performance

A 3.6m (11ft 10in) Duplex mast

B 4.5m (14ft 9in) Free lift Triplex mast

C 5.5m (18ft 0in) Triplex mast

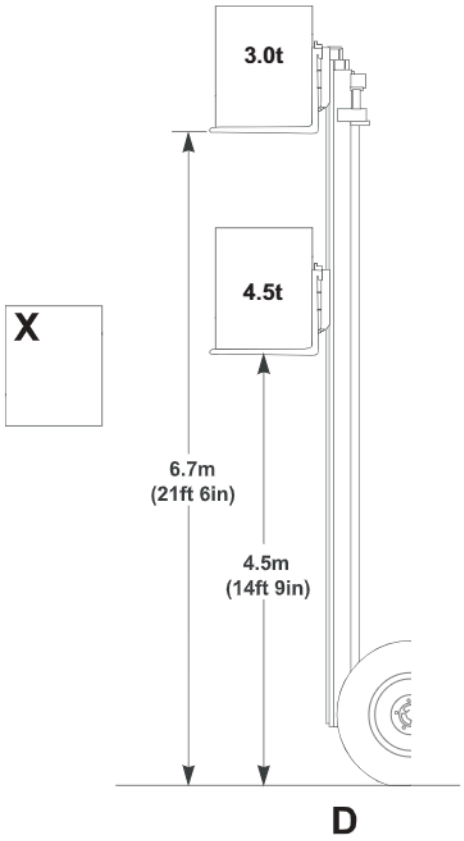
D 6.7m (21ft 6in) Triplex

X Bar and Industrial carriage

950

Note: *Complies with ISO 22915-13.*

Important: *The following data is intended for quick reference only. Always refer to the rating plate in the cab.* ***Refer to Fork Ratings, Working with the Machine, Operation****.*



823680-2

Fig 138. Lift Performance

D 6.7m (21ft 6in) Triplex

X Bar and Industrial carriage

Maximum Wading Depth

The maximum wading depth of these machines is 370mm (14.5in). Water can enter the engine and axles and the cooling fan can be damaged if the machine is operated in deeper water.

Important: *Under no circumstances must the rear axle breather be blanked off, as this could cause a reduction in brake efficiency.*

Noise Data

Introduction

T5-008_2

To assist in compliance with European Directives 2000/14/EC and 2005/88/EC, the noise data values for this type of machine have been provided on the following page(s) and may be used for the assessment of risks to exposure from noise.

The noise data values shown only apply to CE marked machines.

For information relating to this machine when used with other JCB approved attachments, please refer to the literature accompanying the attachments.

Definition of terms:

LpA A-weighted sound pressure level measured at the operator's station.(1)

LwA Equivalent A-weighted sound power level emitted by the machine.(2)

(1) Determined in accordance with the test method defined in ISO 6396 and the dynamic test conditions defined on 2000/14/EC.

(2) Guaranteed equivalent sound power (external noise) determined in accordance with the dynamic test conditions defined in 2000/14/EC.

All Machines

Table 9.

Engine rating(1)	LpA	LwA
63kW (Up to end of January 2012)	87	105
55kW (From February 2012)	87	105

(1) Nett Installed power (kW) to ISO14396

Vibration Data

Introduction

T5-001

To assist in compliance with European Directive 2002/44/EC, duty specific vibration emission values for this machine type have been provided on the following page(s) and may be used for the assessment of risks to exposure from vibration.

Unless otherwise indicated for a specific operating condition, vibration values are determined with the machine equipped with standard attachments (i.e. bucket, shovel, fork, etc.) for the respective operating condition.

Vibration values are determined from measurements in three perpendicular axes (**X**, **Y** and **Z**). ⇨ *Fig 139. (178)*. The highest weighted (rms) value is used to specify the vibration emission.

Note: *The axis upon which the highest weighted (rms) value occurs is stated on the vibration chart for each of the Machine Operating Duties, see* ***Dominant Axis (X, Y or Z)****.*

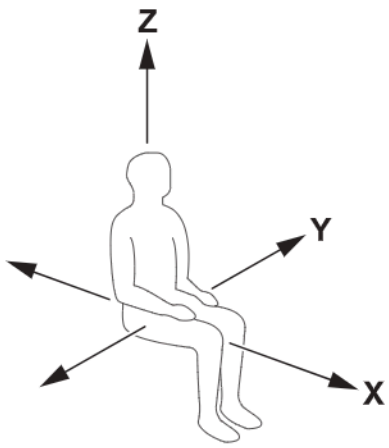


Fig 139.

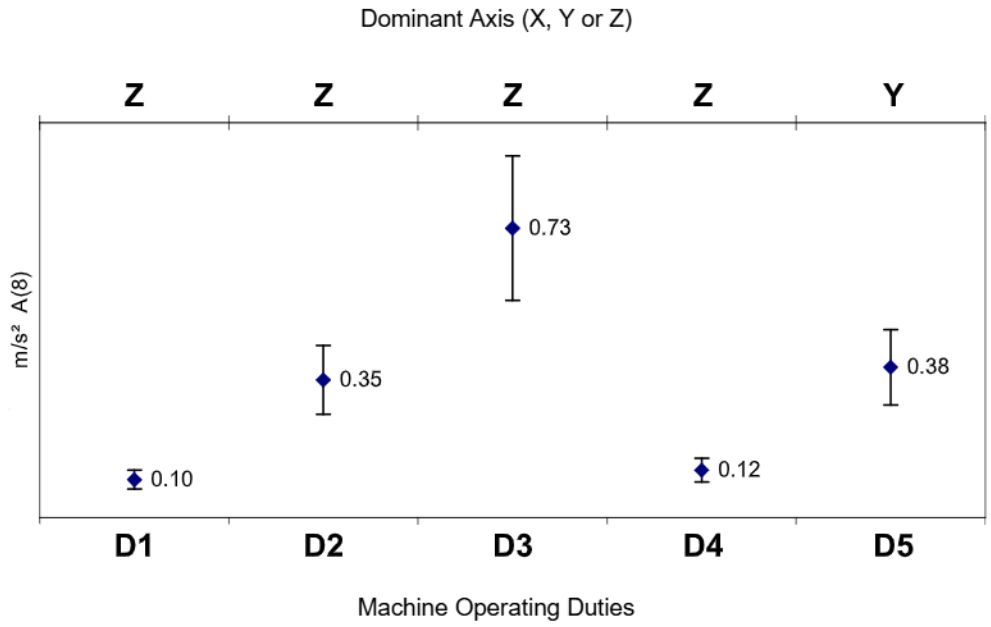
Minimising Exposure to Vibration

Exposure to vibration can be minimised through:

- Selection of the correct size and capacity of machine, equipment and attachments for a particular application.
- Use of a machine equipped with an appropriate seat, keeping the seat maintained and adjusted.
- Checks to ensure that the machine is properly maintained, reporting and correcting any faults.
- Steering, braking, accelerating, shifting gears, moving the attachments and load smoothly.
- Adjusting the machine speed and travel path to minimize the vibration level.
- Keeping the terrain on worksites where the machine is working and travelling in good condition, removing any large rocks or obstacles and filling in any ditches and holes.
- Choosing routes that avoid rough surfaces and, if this is not possible, drive more slowly to avoid bumping and jolting.
- Travelling over longer distances at an adjusted (medium) speed.
- Avoiding bad postures, i.e. slumping in your seat, constantly leaning forward or sideways or driving with your back twisted.

All Models

Table 10. Whole-Body Vibration Emission Under Representative Operating Conditions (According to the Intended Use)



Whole-body vibration emission determined in accordance with ISO 2631-1:1997 for this machine type is 0.38 m/s² normalised to an 8-hour reference period [A(8)] and based upon a test cycle "defined in SAE J1166".

Note: *If SRS (Smooth Ride System) is fitted, the whole body vibration emission for* ***D3*** *Roading (rough terrain) is 0.59 m/s²*

Hand-arm vibration determined in accordance with dynamic test conditions defined in ISO 5349-2: 2001 does not exceed 2.5 m/s².

Note: *Errors bars are due to variations in vibration emissions due to measurement uncertainty (50% in accordance with EN 12096:1997).*

Machine Operating Duties

D1	Low Idle
D2	Roading (tarmac)
D3	Roading (rough terrain)
D4	Lift cycles
D5	Pick and place cycles

Tyre Sizes and Pressures

Introduction

The maximum pressure embossed on the tyre may differ from the pressure stated below. Inflate to the pressures in the tables, these are agreed with the tyre manufacturer/s in accordance with the European Tyre and Rim Technical Organisation (ETRTO) standards to satisfy machine stability performance.

If the tyres fitted to your machine are not listed, then contact your JCB Distributor for advice, do not guess tyre pressures.

Specifications

All Models

Table 11. Model 926-2

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	3.0	43.5	12 x 25	ET - 20
3	12.5/80 X 18	10	GOODYEAR	PLY RIB & BAR - AM IMPLEMENT	2.5	36	11 x 18	ET - 7
4	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
5	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 12. Model 926-4

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5/80 X 24	12	GOODYEAR	SURE GRIP IMPLEMENT (SGI)	2.5	36	14 x 24	ET + 20
3	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
4	10.5/80 x 18	10	BKT	AT-603	5.1	74	9 x 18	ET + 18
5	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 13. Model 930-2

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	3.75	53.5	12 x 25	ET - 20
3	12.5/80 X 18	10	GOODYEAR	PLY RIB & BAR - AM IMPLEMENT	2.9	41	11 x 18	ET - 7
4	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
5	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 14. Model 930-4

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	3.9	56.5	12 x 25	ET - 20
3	15.5/80 X 24	12	GOODYEAR	SURE GRIP IMPLEMENT (SGI)	3.0	43.5	14 x 24	ET + 20
4	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
5	10.5/80 x 18	10	BKT	AT-603	5.1	74	9 x 18	ET + 18
6	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 15. Model 940-2

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	4.0	58	12 x 25	ET - 20
3	12.5/80 X 18	10	GOODYEAR	PLY RIB & BAR - AM IMPLEMENT	3.1	46	11 x 18	ET - 7
4	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
5	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 16. Model 940-4

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	16.5/85 X 24	8	SOLIDEAL	SLR1	2.9	41	14 x 24	ET + 20
2	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	4.0	58	12 x 25	ET - 20
3	15.5/80 X 24	12	GOODYEAR	SURE GRIP IMPLEMENT (SGI)	3.6	52	14 x 24	ET + 20
4	12.5/80 X 18	10	GOODYEAR	PLY RIB & BAR - AM IMPLEMENT	3.1	46	11 x 18	ET - 7
5	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12
6	10.5/80 x 18	10	BKT	AT-603	5.1	74	9 x 18	ET + 18
7	12.5 x 18	12	SOLIDEAL	MPT 4L 13	4.25	62	11 x 18	ET - 7

Table 17. Model 950-4

Item	Size	Ply	Make	Name	Pressure		Rim	
					bar	lbf/in²	Size	Offset
1	15.5 X 25	12	GOODYEAR	SURE GRIP LOADER (SGL)	4.0	58	12 x 25	ET - 20
2	14 x 17.5	10	SOLIDEAL	SD SKS CLASSIC	3.85	56	10.5 x 17.5	ET + 12

Warranty Information

Machine Service Record Sheet

T6-003

Installation Checklist Date:	

3000 Hrs./36 Month Annual insurance Date: Hour reading:	

1st 100 Hrs./1 Month Date: Hour reading:	

3500 Hrs./42 Month Date: Hour reading:	

500 Hrs./6 Month Date: Hour reading:	

4000 Hrs./48 Month Annual insurance Date: Hour reading:	

1000 Hrs./12 Month Annual insurance Date: Hour reading:	

4500 Hrs./54 Month Date: Hour reading:	

1500 Hrs./18 Month Date: Hour reading:	

5000 Hrs./60 Month Annual insurance Date: Hour reading:	

2000 Hrs./24 Month Annual insurance Date: Hour reading:	

5500 Hrs./66 Month Date: Hour reading:	

2500 Hrs./30 Month Date: Hour reading:	

6000 Hrs./72 Month Annual insurance Date: Hour reading:	

6500 Hrs./78 Month Date: Hour reading:	

7000 Hrs./84 Month Annual insurance Date: Hour reading:	

7500 Hrs./90 Month Date: Hour reading:	

8000 Hrs./96 Month Annual insurance Date: Hour reading:	

8500 Hrs./102 Month Date: Hour reading:	

9000 Hrs./108 Month Annual insurance Date: Hour reading:	

9500 Hrs./114 Month Date: Hour reading:	

10000 Hrs./120 Month Annual insurance Date: Hour reading:	

Registration Information

T6-001

Customer Copy

Dealer

JCB Model

P.I.N./Machine Serial Number

V.I.N.

Vehicle Registration Number

Engine Serial Number

Registration Date

Installing Engineer

Dealer Copy (U.K. and Eire only) - Do not send back to JCB Service. A copy of the registration details to be sent direct to:

The Equipment Register Ltd. (T.E.R.)
Bath and West Buildings
Lower Bristol Road
Bath, BA2 3EG
Tel: 01225 464599 (24 Hour)
Fax: 01225 317698

Customer Copy - Do not remove this portion from the Operator Manual.

Dealer Copy

Dealer

JCB Model

P.I.N./Machine Serial Number

V.I.N.

Vehicle Registration Number

Engine Serial Number

Registration Date

Installing Engineer

Customer's Name

Address

P.D.I. Date

Owner's Plant Reference No.

Alpha Dot Security System **Yes/No**

Please send details of: 'JCB Assetcare Machinery Protection Plan' **Yes/No**

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European Community Standards

EC Declaration of Conformity

Introduction

TS-006_3

A completed copy of the EC Declaration of Conformity is supplied with all machines manufactured according to EC type examination and/or self-certification requirements.

A sample copy of the EC Declaration of Conformity and a summary of the information that can appear is provided. Refer to ***Explanation of the EC Declaration of Conformity***.

DECLARATION OF CONFORMITY

NAME AND ADDRESS OF MANUFACTURER:	A
HEREBY DECLARES THAT THE MACHINERY / EQUIPMENT DESCRIBED BELOW:	
DESIGNATION OF MACHINERY/EQUIPMENT:	P
DESCRIPTION OF MACHINERY / EQUIPMENT:	B
TRADE NAME:	JCB
MODEL NAME:	C
SERIAL NUMBER OF MACHINERY / EQUIPMENT	D

COMPLIES WITH THE PROVISIONS OF THE "MACHINERY DIRECTIVE" (DIRECTIVE 2006/42/EC AS AMENDED).

THE FOLLOWING STANDARDS HAVE BEEN USED:	E
NAME AND ADDRESS OF THE PERSON WHO COMPILES THE TECHNICAL DOCUMENTATION:	F

COMPLIES WITH THE PROVISIONS OF THE "ELECTRO-MAGNETIC COMPATIBILITY DIRECTIVE" (DIRECTIVE 2004/108/EC AS AMENDED).

COMPLIES WITH THE PROVISIONS OF THE "NOISE EMISSIONS IN THE ENVIRONMENT BY EQUIPMENT FOR USE OUTDOORS DIRECTIVE" (DIRECTIVE 2000/14/EC AS AMENDED).

NAME AND ADDRESS OF THE PERSON WHO KEEPS THE TECHNICAL DOCUMENTATION:	G
CONFORMITY ASSESSMENT PROCEDURE:	H
NAME AND ADDRESS OF NOTIFIED BODY:	J
MEASURED SOUND POWER LEVEL ON EQUIPMENT REPRESENTATIVE FOR THIS TYPE:	K
GUARANTEED SOUND POWER LEVEL FOR THIS EQUIPMENT:	
NET INSTALLED POWER / MASS OF APPLIANCE:	L

PLACE OF DECLARATION:	M
DATE OF DECLARATION:	XX/XX/XXXX
NAME OF AUTHORISED SIGNATORY:	
POSITION:	N
SIGNATURE:	XXXXXX

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Fig 140.

Explanation of the EC Declaration of Conformity

⇒ *Fig 140. (🗋 188)*.

A JCB Compact Products Ltd.
Harewood Estate
Leek Road
Cheadle
Stoke on Trent
United Kingdom
ST10 2JU

B Lift Truck, Combustion-Engine Driven, Counterbalanced (Rough Terrain Trucks)

C Refer to ***Machine Model and Serial Number***.

D Refer to ***Typical Product Identification Number (PIN)***.

E EN 474-1:2006+A1:2009
EN 474-4:2006 +A1:2009

F Engineering Manager
JCB Compact Products Ltd.
Harewood Estate
Leek Road
Cheadle
Stoke on Trent
United Kingdom
ST10 2JU

G Mr C. J. Knowles
J.C. Bamford Excavators Ltd
Lakeside Works
Rocester
Staffordshire
United Kingdom
ST14 5JP

H Annex VI - Procedure 1

J A. V. Technology
A.V. House
Birdhall Lane
Stockport
Cheshire
United Kingdom
SK3 0XU

K Refer to ***Noise Data (Specification Section)***.

L Refer to ***Noise Data (Specification Section)***.

M Rocester

N Managing Director

P Rough terrain truck

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