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SAFETY FIRST - YOURS AND OTHER PEOPLES

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

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

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

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

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

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

Remember

BE CAREFUL
BE ALERT
BE SAFE

INT-1-3-1/1

SAFETY FIRST - CHECK LIST

General Safety

⚠ WARNING

Handbook

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

INT-1-3-2

⚠ CAUTION

Regulations

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

INT-1-3-3

⚠ WARNING

Decals

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

INT-1-3-4

⚠ 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.

INT-1-3-6

⚠ WARNING

Raised Attachments

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

INT-1-3-8

⚠ WARNING

Alcohol and Drugs

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

INT-1-3-9

⚠ WARNING

Machine Modifications

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

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

INT-1-3-10

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LIFTING THE MACHINE

Carry out the following procedure when lifting a machine:

Lower the loader arms to the ground.

Remove all attachments.

Fit the articulation lock, *see* ***Installing the Articulation Lock*** *(MAINTENANCE section).*

Switch OFF the engine, remove the key, vacate the machine and shut the door(s).

Remove all loose equipment from machine exterior.

Check the unladen weight of the machine, *see* ***Static Dimensions*** *(SPECIFICATIONS section).*

⚠ WARNING

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.
INT-1-3-7

Attach lifting equipment to four lifting points **A**.

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

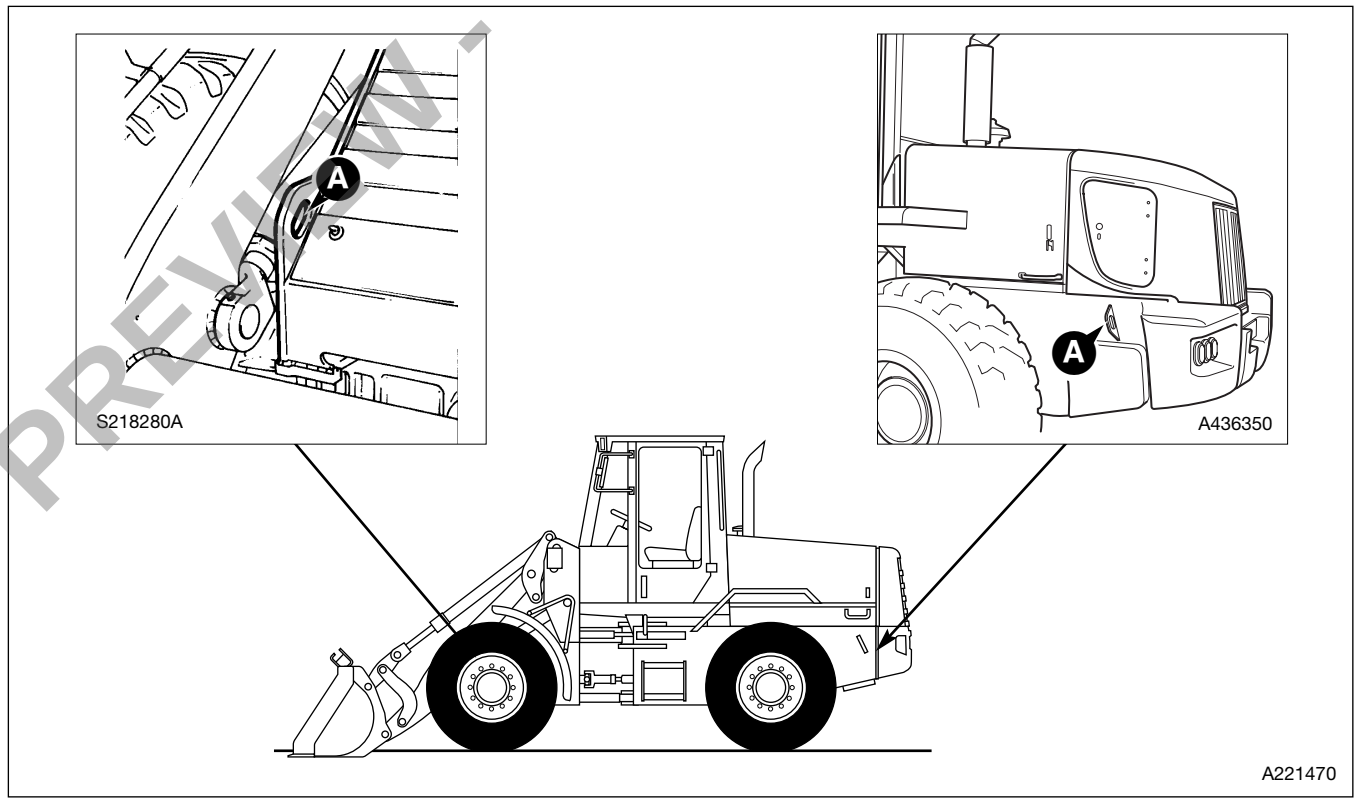
Check that the lifting eye is positioned directly above the machine centre of gravity, *see* ***Static Dimensions*** *(SPECIFICATIONS section).*

⚠ DANGER

Do not stand underneath a raised load. Stand clear and to one side until the load has been safely lowered. Make sure that the area is clear of other people before lowering the load. If you do not follow these precautions you or others could be killed or seriously injured.
2-3-5-3

⚠ WARNING

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure any hand signals that may be used are understood by everybody. Work sites can be noisy, do not rely on spoken commands.
INT-2-2-3



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CAB LAYOUT

1 Steering Wheel

2 Display Panel (see Page 35)

3 Steering Column Switch (see Page 30)

4 Engine Starter/Stop Switch (see Page 32)

5 Steering Column Tilt Lock (see Page 33)

6 Accelerator Pedal (see Page 27)

7 Parking Brake Lever (see Page 27)

8 Brake Pedal (see Page 27)

9 Master Warning Light (see Page 37)

10 Forward/Reverse Lever (see Page 29)

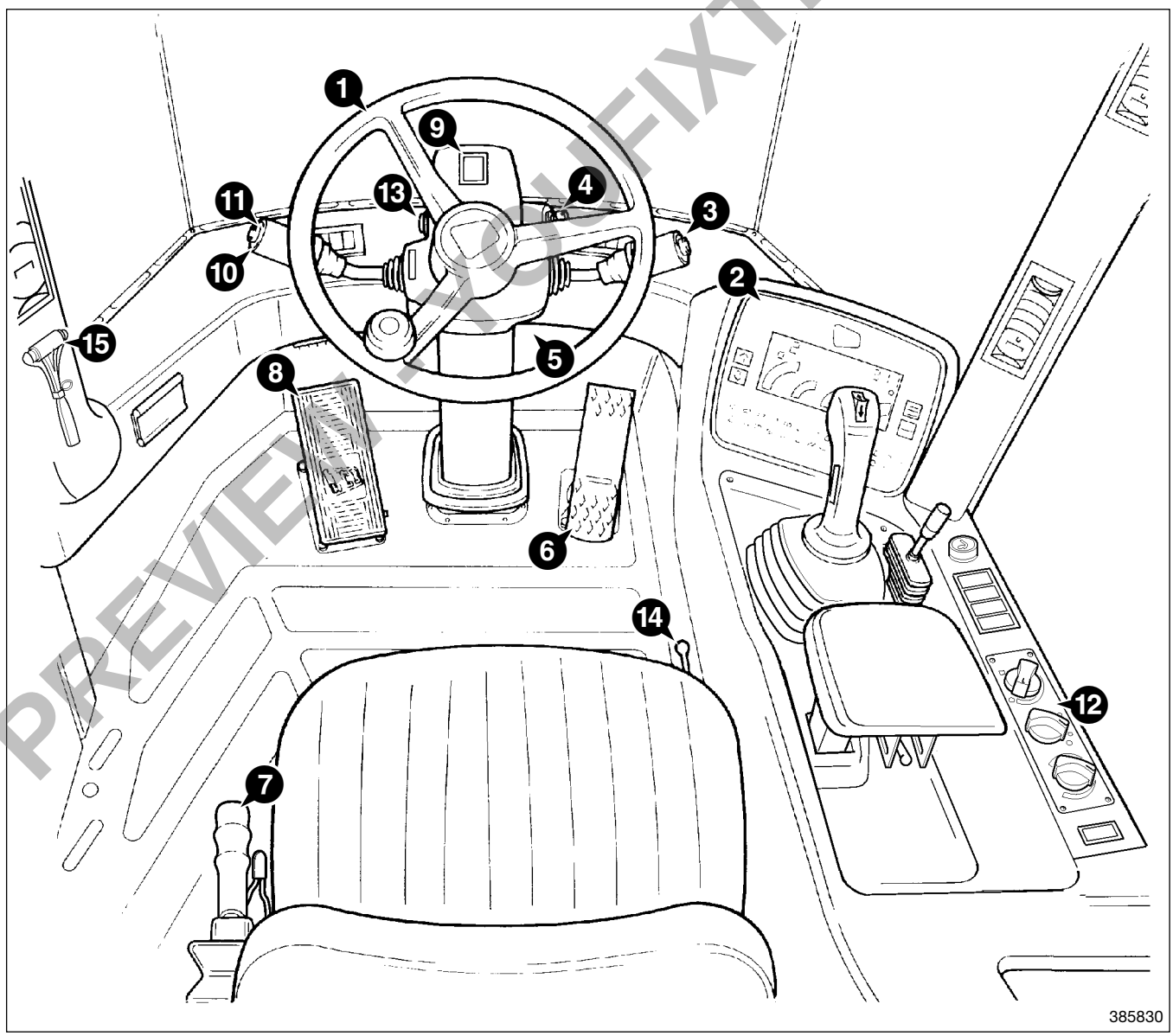
11 Gear Change Switch (see Page 28)

12 Heater Controls (see Page 39)

13 Hazard Light Switch (see Page 31)

14 Loader Controls Lock (see Page 34)

15 Emergency Glazing Breaker (see Page 23)



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AIR CONDITIONING COMPRESSOR DRIVE BELT

Adjusting the Compressor Belt

⚠ WARNING

Make sure the engine cannot be started. Disconnect the battery before doing this job.
2-3-3-5

1 Park the machine on level ground.

2 Apply the parking brake, put the transmission in neutral and stop the engine.

3 Open the right side engine panel.

4 Loosen pivot bolt **A** (Not shown). Loosen bolts **B** and **C**.

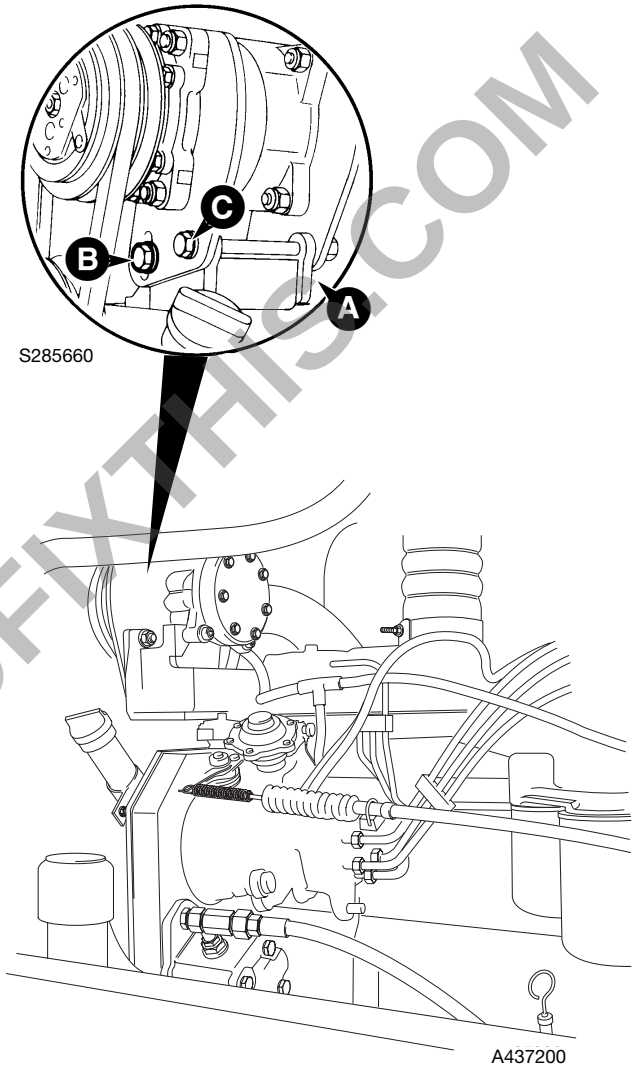
5 Adjust the belt by positioning the compressor to give 5 mm (3/16 in) slack at the mid point of the longest run.

6 Tighten bolts **B** and **C**. Tighten pivot bolt **A**.

7 Close and lock the engine panel.

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.
4-3-4-1/2



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FUEL SYSTEM

Types of Fuel

Use good quality diesel fuel to get the correct power and performance from your engine. The recommended fuel specification is given below.

Cetane Number:	45 (minimum)
Viscosity:	2.5/4.5 centistokes at 40°C (104°F)
Density:	0.835/0.855 kg/litre (0.872/0.904 lb/pint)
Sulphur:	0.5% of mass (maximum)
Distillation:	85% at 350°C (662°F)

Cetane Number

Indicates ignition performance. Fuel with a low cetane number can cause cold start problems and affect combustion.

Viscosity

Is the resistance to flow. If this is outside limits, the engine performance can be affected.

Density

Lower density will reduce engine power. Higher density will increase both engine power and exhaust smoke.

Sulphur

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 also use a highly alkaline engine lubricating oil; or change the normal oil more frequently.

Low sulphur fuels are commonly used throughout the world. These fuels contain fewer lubrication additives. The fuel injection pumps (with exception of 160TW, Euro 1 engine) are lubricated by the fuel; therefore using low sulphur fuel may, in the long term, affect the pump.

If you have to use a low sulphur fuel your are advised to use a lubrication additive as recommended by your fuel supplier.

Distillation

This indicates the mixture of different hydrocarbons in the fuel. A high ratio of lightweight hydrocarbons can affect the combustion characteristics.

Fuel Standards

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

Low Temperature Fuels

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

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

Petrol

⚠ WARNING

Do not use petrol in this engine. Do not mix petrol with the diesel fuel. In storage tanks the petrol could rise to the top and form flammable vapours.
INT-3-1-6

Advice

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

Fatty Acid Methyl Ester Fuels as a replacement for Diesel Fuels

Fuel resources such as Rape Methyl Ester and Soybean Methyl Ester, collectively known as Fatty Acid Methyl Esters are being used as altenatives and extenders for mineral oil.

Fatty Acid Methyl Esters must conform to certain standards to be of acceptable quality, just as mineral oils do at present.

Consult your JCB Distributor for advice about the use of Fatty Acid Methyl Ester Fuels, as improper application may impair engine performance.

⚠ WARNING

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

Filling the Tank

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

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

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ENGINE AIR FILTER

Changing the Air Filter Elements

Note: *In a dusty working environment, the outer element may have to be renewed more frequently. A new inner element must be fitted at latest every third time the outer element is changed. As a reminder, mark the inner element with a felt tip pen each time you change only the outer element. DO NOT attempt to wash or clean elements - they must be renewed.*

⚠ 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

1 Apply the parking brake, put the transmission in neutral and stop the engine.

2 Open the right side engine cover.

3 If changing the inner element, disconnect the filter induction hose **H** to prevent dust getting into the engine. Cover the hose to prevent rain and dirt getting into the engine.

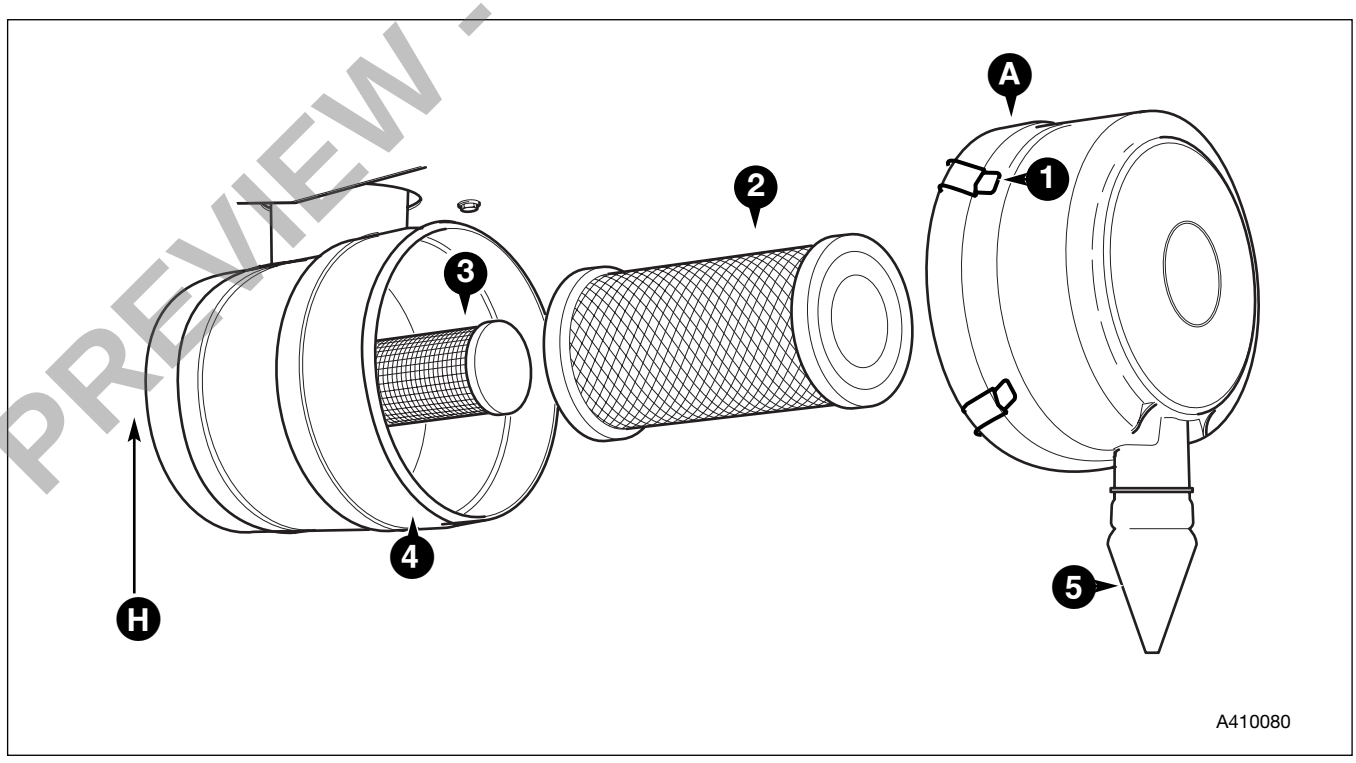
4 Release the end cover spring clips **1** and remove end cover **A**. Pull out the outer element **2**. Take care not to tap or knock the element as you remove it. If necessary, pull out the inner filter **3**.

5 Clean inside housing **4** and dust valve **5**.

6 Carefully insert the new elements into the canister. Make sure that they are seated correctly.

7 Refit cover **A** and fasten the spring clips Make sure that dust valve **5** is at the bottom.

8 Connect the induction hose **H**. Make sure the air filter blocked switch connector is fitted. Check all hoses for condition and tightness.



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TYRES AND WHEELS

Inflating the Tyres

⚠ WARNING

Tyres and Rims

Over-inflated or over-heated tyres can explode. Follow the instructions in this handbook for inflating the tyres. Do not weld or cut rims. Get a tyre/wheel specialist to do any repair work.

INT-3-2-6

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 Before you add air to the tyre, make sure it is correctly fitted on the machine or installed in a tyre inflation cage.

2 Use only an air supply system which includes a pressure regulator. Set the regulator no higher than 1.38 bar (20 lbf in^2) above the recommended tyre pressure.

Use an air hose fitted with a self-locking air chuck and remote shut-off valve.

3 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.

Inflate the tyre to the recommended pressure. *Do not over-inflate.*

Checking the Wheelnut Torques

On new machines, and whenever a wheel has been removed, check the wheel nut torques every 2 hours until they stay correct.

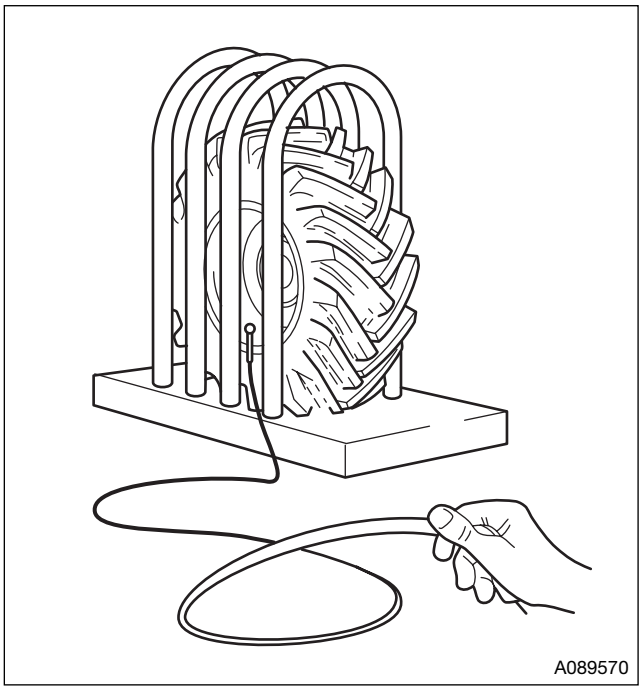
The correct torques are shown in the table below.

436	
Nm	lbf ft
600	443

⚠ 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



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LOADER CONTROLS

Standard Shovel

1 Loader arm raise.

2 Loader arm lower.

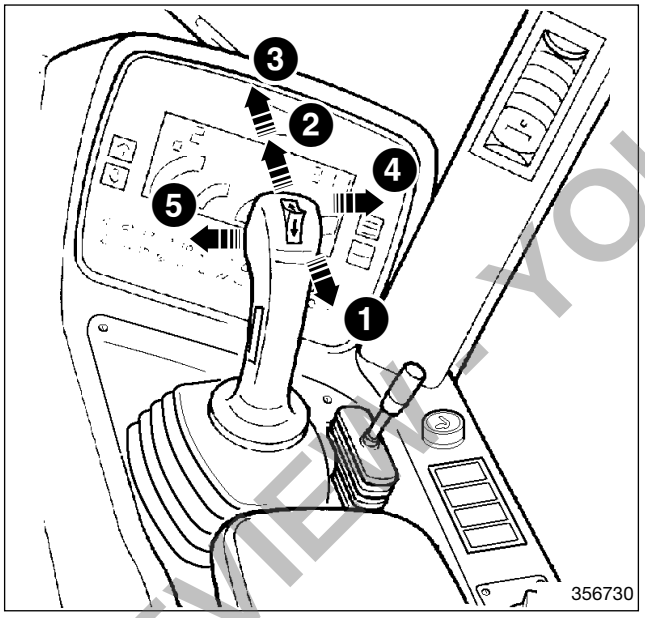
3 Arm float
Push the lever forward as far as it will go, and leave it there.

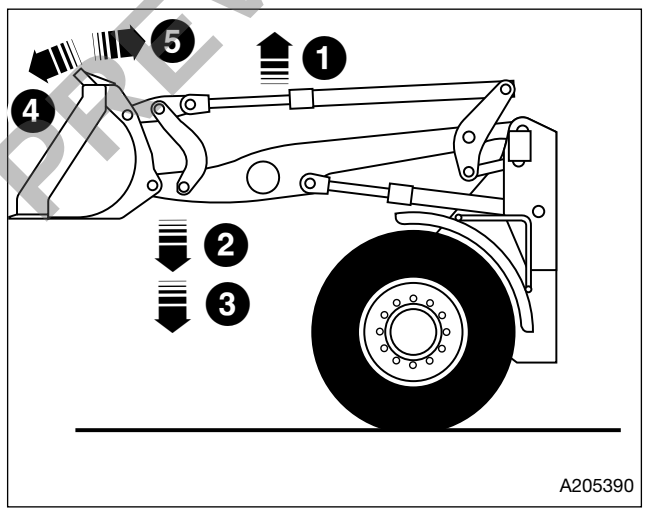
4 Shovel open.

5 Shovel close.

⚠ CAUTION

If Float is selected with the loader raised, the loader will descend to ground level and 'float' across it as you travel. You will have no control over the rate of fall.
2-2-2-7





Auxiliary Attachment

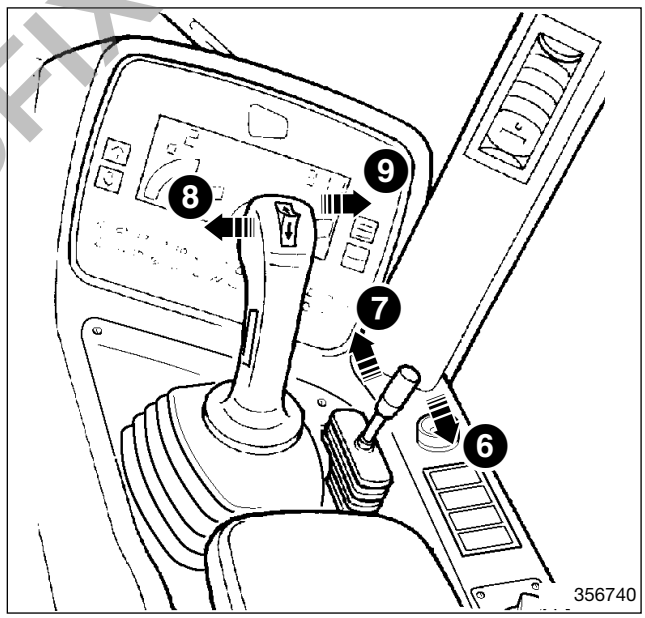
6 Attachment control.

7 Attachment control.

Note: *Control will depend on the way the hoses are connected and the type of attachment fitted. It will also be affected by the position of the Hydraulic Circuit Changeover Switch, if a fourth service is fitted.*

8 Tilt up.

9 Tilt down.



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TRANSPORTING THE MACHINE

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine attachments or parts that may move during transit must be adequately secured
5-2-5-9

Note: *Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.*

Make sure that the transporting vehicle is suitable. See ***Static Dimensions*** *in SPECIFICATIONS section for the dimensions of your machine.*

⚠ WARNING

Ramps and Trailers

Water, mud, ice, grease and oil on ramps or trailers can cause serious accidents. Make sure ramps and trailers are clean before driving onto them. Use extreme caution when driving onto ramps and trailers.
INT-2-2-6

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

2 **a** Make sure the ramps are correctly in place and secure.

b Raise the shovel to approximately 305 mm (12 in) from the ground.

c Carefully drive the machine onto the trailer.

d When the machine is safely in position, lower the Loader Shovel.

e Set the drive to neutral and engage the parking brake.

f Check that the overall height of the load is within regulations. Adjust if necessary.

g Switch off the engine.

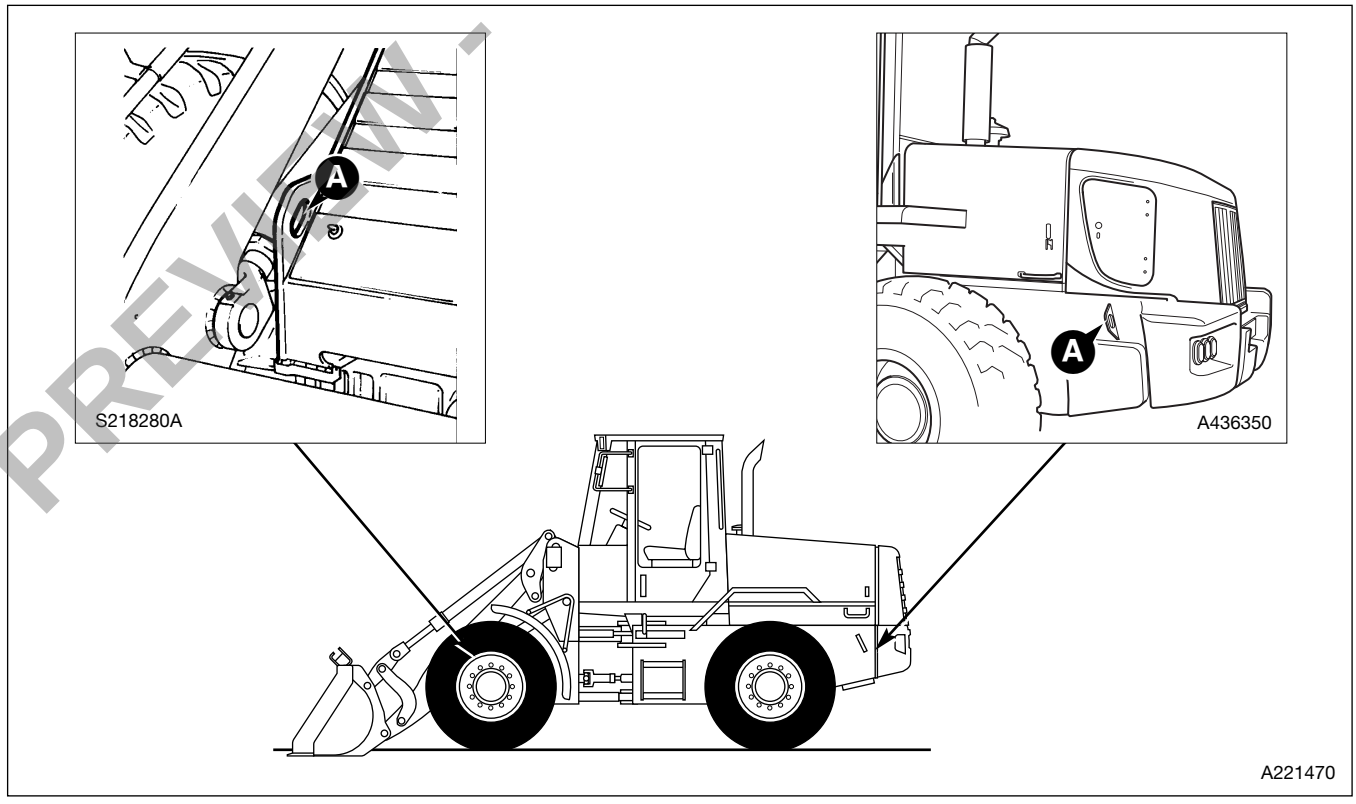
h Install the articulation lock.

i Secure the cab.

j Cover the exhaust stack.

3 Put blocks at the front and rear of all four tyres. Anchor the machine to the trailer with chains, using the four holes **A** in the chassis side plates at the front and rear.

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



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SERVICE RECORD SHEET ..... At back of book

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EMERGENCY STEER SYSTEM

On start up the low steer pressure switch and the emergency steering system is checked for functionality. If working correctly, the machine will start.

The engine will not start if:

a The low steer pressure switch is faulty.

b The emergency steer system fails to operate.

If primary steering fails during operation, the machine goes into 30 second shut down mode. The buzzer will sound and the low steer pressure light illuminates. The emergency steering system should automatically be activated. The machine should be stopped as soon as possible. The emergency steering system operates at speeds in excess of 3KPH.

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