⚠ WARNING

Study This Handbook Before Starting The Machine

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

INT-1-1-1

⚠ CAUTION

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

8-4-1-6

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

⚠ DANGER

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

INT-1-2-1

⚠ WARNING

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

INT-1-2-2

⚠ CAUTION

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

INT-1-2-3

MACHINE SECURITY

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

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

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

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

INT-1-2-4

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DRIVE CONTROLS, SWITCHES AND INSTRUMENTS (continued)

Controls (Continued)

6 Forward/Reverse Lever

⚠ WARNING

You and others can be killed or injured if you operate the forward/reverse lever while travelling. The machine will immediately reverse direction without warning to others. Follow the recommended procedure for proper use of this selector.
2-2-2-4

⚠ WARNING

Reversing

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

Stop the machine before moving this lever. To select forward (**F**), reverse (**R**) or neutral (**N**), move the lever to the position shown. The engine will only start if the lever is in neutral (**N**).

To reverse direction:

a Stop the machine: keep the foot brake applied.

b Let the engine speed drop to idle.

c Select the new direction.

d Release the foot brake and accelerate away.

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

Neutral Lock

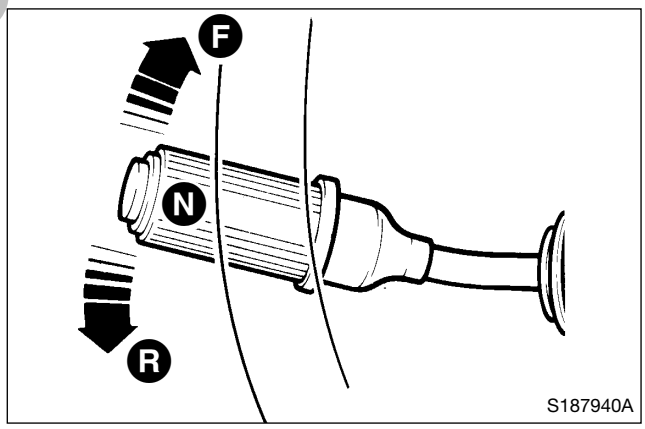
To prevent accidental operation of the forward/reverse lever, while entering or leaving the cab, the lever can be locked in the neutral position.

With the selector in the position marked **N**, the lever is locked in neutral.

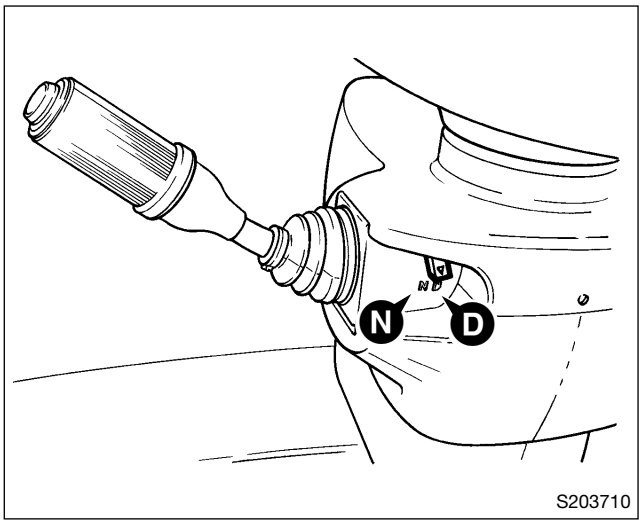
With the selector in the position marked **D**, forward or reverse drive may be selected.

⚠ CAUTION

Do not operate the Forward/Reverse switch on the loader control lever when already using the Forward/Reverse lever otherwise the transmission will select neutral. When using the Forward/Reverse switch, the Forward/Reverse lever MUST be locked in neutral.
4-2-1-6



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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)

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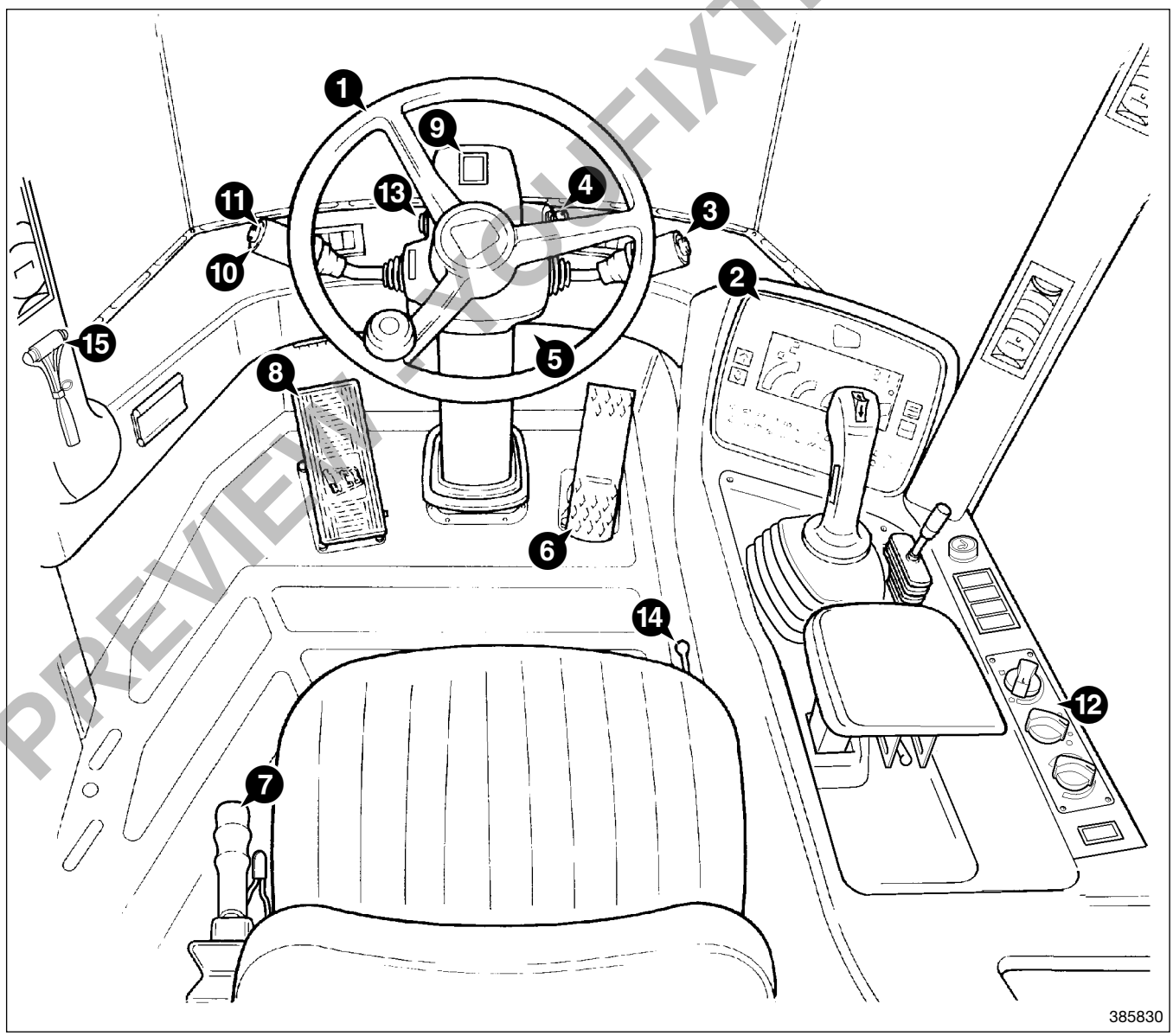
11 Gear Change Switch (see Page 28)

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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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INTRODUCTION

This part of the handbook provides information on the optional attachments which are available for the JCB Wheeled Loader.

INTRODUCTION

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

JCB attachments are designed and manufactured specifically to suit the machine's hydraulic system, mounting arrangements and safe load requirements. Attachments which are not designed for use with this machine may cause damage and create safety hazards for which JCB cannot be held responsible. In addition the machine's warranty will be affected by the use of non-approved attachments and also the "CE" compliance, where applicable, will be invalidated.
2-4-1-13/2

For other JCB attachments this information is provided in the form of a specific handbook supplied with each attachment. General installation and removal procedures for these attachments are, however, included here.

Before installing, using or removing any optional attachment, make sure you read and understand the information provided. If there is anything you do not understand, ask your JCB distributor.

Various attachments are available for the 411 Wheeled Loader, either Quickhitch or direct mounted. Install and remove these attachments as described on the following pages.

⚠ CAUTION

If you have an attachment which is not covered in this handbook, don't 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

Should you consider fitting an attachment from an alternative manufacturer, we strongly recommend that you first seek the expert advice of your JCB Distributor to ascertain the compatibility of the attachment with the machine.

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ARTICULATION LOCK

Installing the Articulation Lock

⚠ WARNING

Make sure the articulation safety lock is fitted before transporting the machine. The articulation safety lock must also be fitted if you are inspecting and/or doing any maintenance work in the articulation danger zone.
16-3-1-3

On the Wheeled Loader, the articulation safety lock is stowed on the machine as shown. The articulation lock is fitted with the machine in a 'straight ahead' position.

1 Steer the machine to bring the front and rear wheels in a straight line.

2 Apply the parking brake, put the transmission in neutral.

3 Remove pin **A** and pivot articulation lock into locking position, replace pin **A** at position **1**. If pin will not fit, turn steering wheel slightly to align hole.

4 Stop the engine.

Removing the Articulation Lock

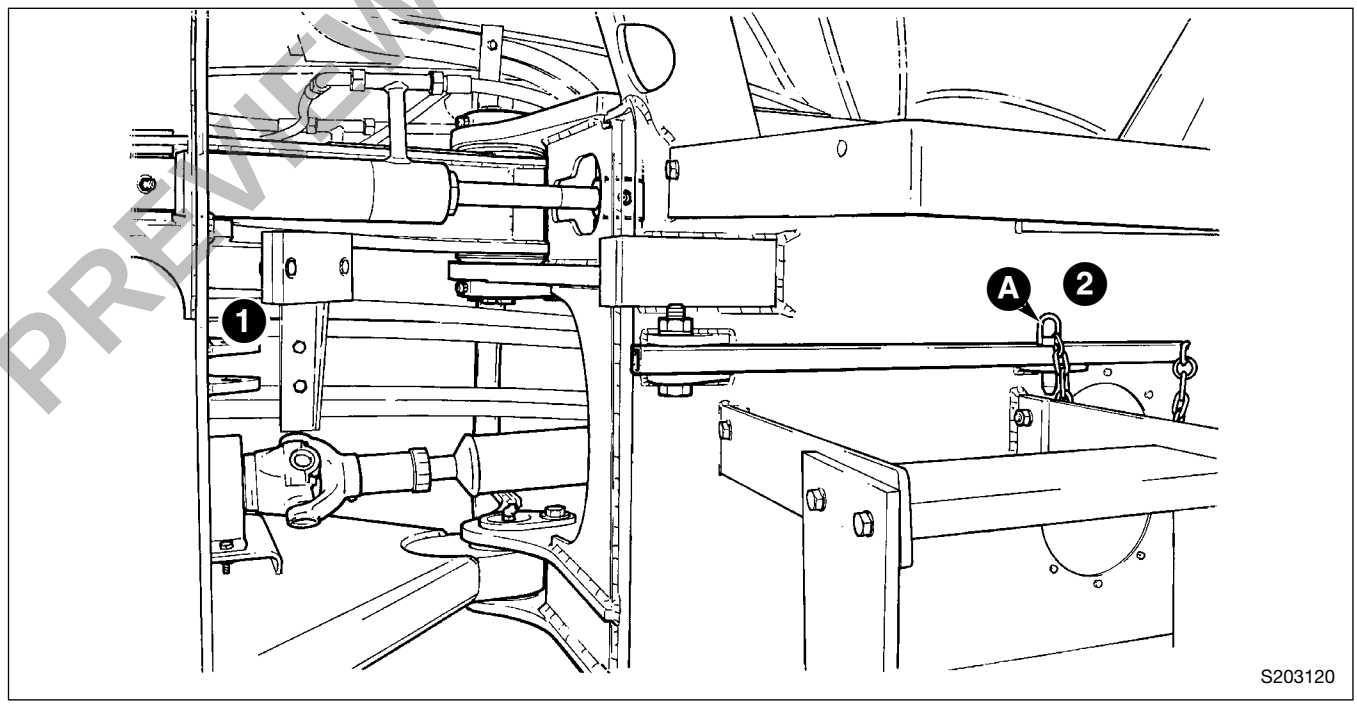
⚠ WARNING

Always make sure the articulation safety lock has been removed before attempting to drive the machine. The machine cannot be steered with the articulation lock fitted.
16-3-1-4

1 Remove pin **A**.

2 Return the articulation lock to its stowage position as shown.

3 Lock the articulation lock into its stowage position by replacing pin at position **2** as shown.



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FUEL SYSTEM (continued)

Changing the Fuel Filter

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

⚠ CAUTION

The engine no longer carries a mechanical lift pump. The fuel system now incorporates an electric pump built into the filter head. As the pump is fed from the machine's ignition circuit, it is important that the ignition is turned off whenever the fuel system is being worked on.
0104

2 Open the engine canopy.

3 Grasp the filter bowl **C**, and unscrew from the filter housing **D**.

4 To remove the elementt from the bowl. Push downwards on the element and turn it one quarter of a turn anti clockwise. The element can now be lifted from the bowl.

5 Wash out the bowl with clean fuel.

6 Replace the bowl sealing ring **E**. (A new sealing ring must be fitted whenever the bowl is separated from the filter housing).

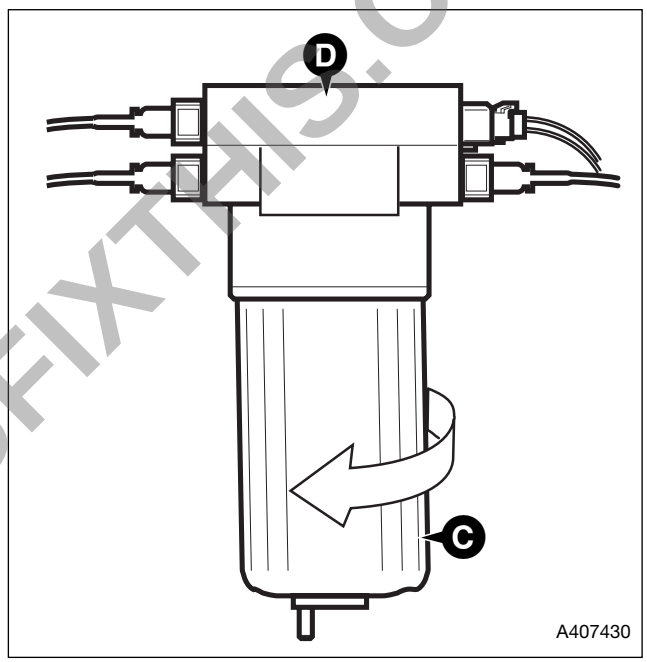
7 Insert a new element into the bowl. Turn the element until it can be felt to drop into its seat. (It will not be possible using a gentle twisting motion to rotate the filter once it is correctly on its seat). Push down on the element and turn one quarter of a turn clockwise **F**. (The filter should now be held securely in place in the bowl).

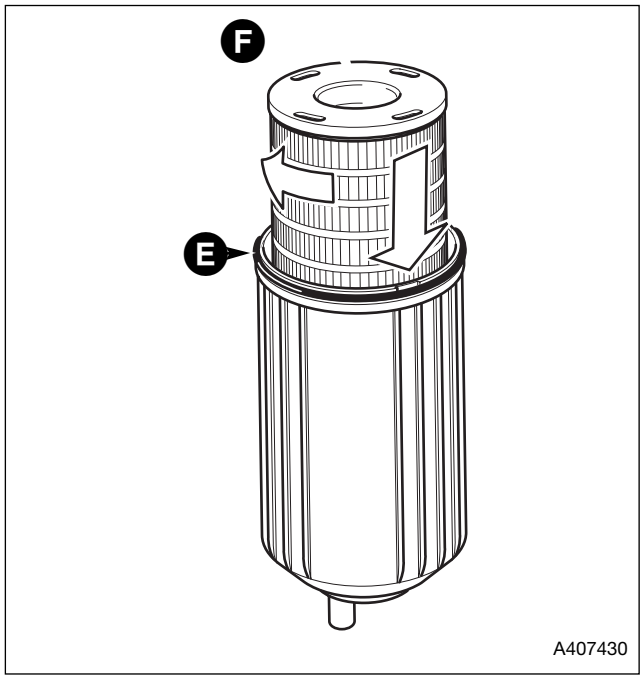
8 Lightly lubricate the filter bowl sealing ring **E**. Re screw the filter bowl back onto the housing. **Tighten the filter bowl by hand only**.

Note: The tread holding the filter element and bowl to the housing is cut internally into the element material. Over tightening can damage the thread.

9 Bleed the fuel system. See ***Bleeding the Fuel System***.

10 Close and lock the engine cover.





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ENGINE AIR FILTER

Changing the 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 **F** to prevent dust getting into the engine. Cover the hose to prevent rain and dirt getting into the engine.

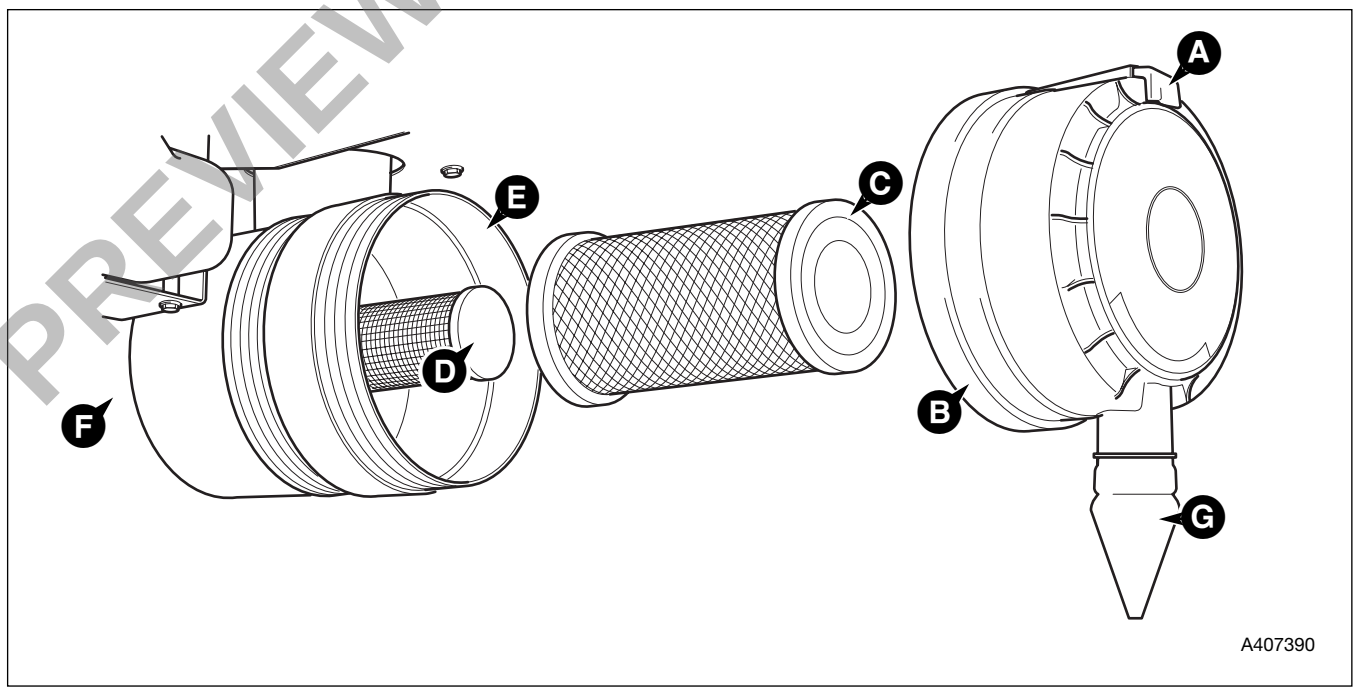
4 Release the end cover lock **A** by pulling the yellow tab outwards. The end cover **B** can now be turned anticlockwise (approximately a quarter of a turn) and the cover removed. Pull out the outer element **C**. Take care not to tap or knock the element as you remove it. If necessary pull out the inner element **D**.

5 Clean inside housing **E** and dust valve **G**.

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

7 Refit cover **B** and fasten the lock. Make sure that dust valve **G** is at the bottom.

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



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JUMP-STARTING THE ENGINE

⚠ 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.

Switch off all circuits which are not controlled by the starter switch.

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.

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.
This machine has a 24 volt, negative earth electrical system. The booster (slave) supply must not be higher than 24 volts. 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.

4-2-2-2

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TESTING THE BRAKES

Parking Brake

⚠ WARNING

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

Test the brake on a level, dry surface. Make sure your seat belt is securely fastened.

1 The attachment should be in the travelling position.

2 Make sure the parking brake is fully engaged

3 Switch off transmission dump.

4 Switch off Auto/Manual switch.

5 Select third gear/range (**3**).

6 **a** On the EMS press the two arrow keys and the SETUP key at the same time, to select the AEB setup menu.

b Use the UP or DOWN arrows to select the park brake test menu.

c Press SETUP key to select **PARK TEST ON**.

7 Push down hard on the brake pedal and select forward drive.

Note: *An audible alarm will sound and a warning light will show when the parking brake is engaged with the machine in forward (**F**) drive. The alarm will stop when neutral (**N**) drive is selected.*

⚠ WARNING

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

8 **a** Release the brake pedal.

b If the machine has not moved, use the accelerator pedal to gradually increase the engine speed to 1500rpm. The machine should not move.

c Reduce the engine speed to idle and set the forward/reverse lever (or switch) to neutral.

Do not do this test for longer than 20 seconds.

9 Press SETUP key again to select **PARK TEST OFF**.

10 Lower attachment and stop the engine.

Note: *If the machine moved during the test, see **Adjusting the Parking Brake** (MAINTENANCE section). Do not use the machine with faulty brakes.*

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

⚠ WARNING

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

⚠ CAUTION

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

Parking Brake Transmission Disconnect

When fully engaged, the parking brake electrically disconnects the transmission drive; this prevents the machine from being driven with the parking brake on.

Service Brake

The service brakes on this machine are backed up by accumulators. In the event of accumulator failure, the foot brakes would be inoperative with the engine stopped.

It is essential that the operation of the accumulators is checked regularly, using the following procedure:

Park the machine on firm level ground, lower the attachments to the ground, apply the parking brake, stop the engine and exhaust the brake sysem by operating the foot brake repeatedly.

Start the engine and run a high rpm for 1 minute.

Stop the engine, apply the foot brake, count the number of operations of the brake pedal until the system is exhausted.

If less than 6 or the brake failure warning light illuminates immediately then one or more of the accumulators may have failed and need immediate replacement.

⚠ WARNING

Do not use a machine with faulty brakes.
0093

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FLUIDS, CAPACITIES AND LUBRICANTS

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). Engines of new machines are filled at the factory with JCB 10W/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown in the lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours operation, it is essential that the 10W/30 oil is replaced by the lubricant recommended below.*

ITEM	CAPACITY	FLUID/LUBRICANT	SPECIFICATION
Engine Oil -10°C to 50°C	10.7 litres (2.4 UK gal)	JCB Extreme Performance Engine Oil 15W/40	ACEA E3/B3/A3 API CH-4/A3
Gearbox †	26 litres (5.7 UK gal)	JCB HP Universal ATF	ZF TE-MIL 09, 11, 12, 14
Axles	25.0 litres (5.6 UK gal)	JCB Special Gear Oil Plus	API GL4 ††
Hydraulic System	125 litres (27.5 UK gal)	JCB Special Hydraulic Fluid	ISO VG32
Cooling System	23 litres (5.1 UK gal)	Four Seasons Anti-freeze & Summer Coolant/Water *(see **Coolant mixture**)*	ASTM D3306, BS6580
Fuel System	140 litres (30.8 UK gal)	Diesel Oil *(see **Types of Fuel**)*	ASTM D975-66T Nos. 1D, 2D.
Grease Points		JCB HP Grease	Lithium based

Note: *The total hydraulic system capacity depends on the equipment being used. Fill the system with all rams closed and watch the level indicator.*

Note: *If JCB Special MPL Grease is used, all 100 hour greasing operations must be carried out at TEN (10) HOUR intervals.*

† The figure quoted is TOTAL system capacity. Use the **'MAX'** and **'MIN'** marks on the dipstick when refilling the system.

†† Must be suitable for use with oil immersed brakes and limited slip differentials (LSD).

Note: *Biodegradable Hydraulic Fluid is a factory option ONLY. Replenish with JCB Biodegradable Multigrade Hydraulic Fluid. For further information, contact Earthmovers Technical Service.*

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ELECTRICAL SYSTEM

Fuses

The electrical circuits are protected by fuses. The fuses are located in a fuse box to the rear of the side console. If a fuse ruptures, find out why and rectify the fault before fitting a new one.

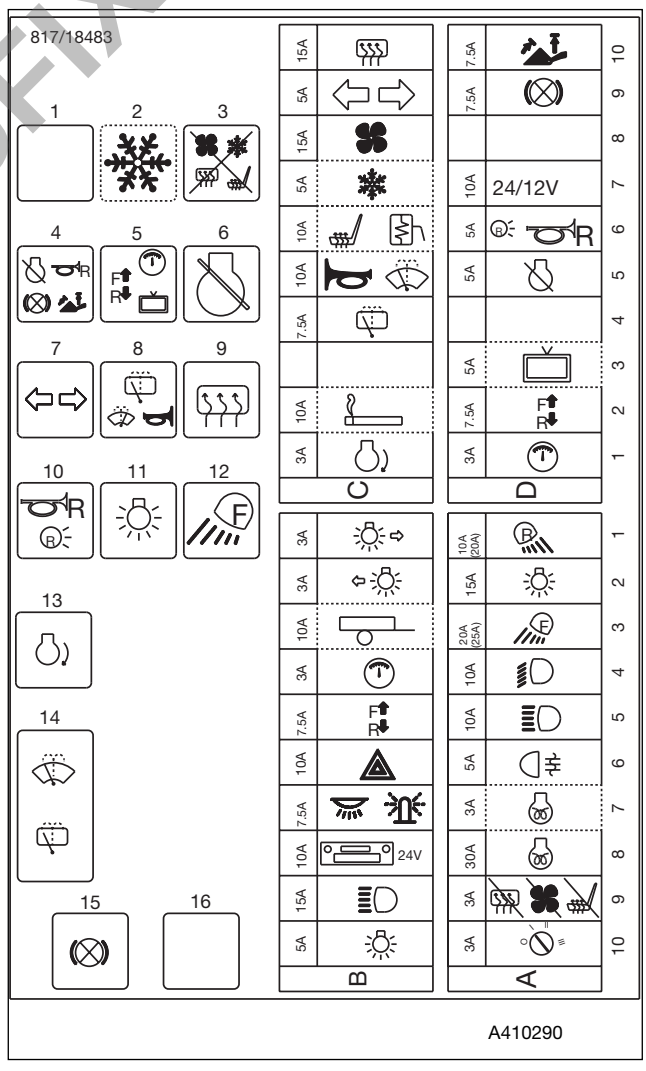
⚠ CAUTION

Fuses

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

8-3-3-5

Fuse No.	Circuit	Fuse Rating (Amps)
A1	Rear Work Lights	10
A2	Road Lights	15
A3	Front Work Lights	20
A4	Dipped Beam	10
A5	Main Beam	10
A6	Rear Fog Lights	5
A7	Glow Plug Relay	3
A8	Blank	-
A9	Dump Relay	3
A10	Ignition Relays	3
B1	Right Side/Tail Lights and Switch Illumination	3
B2	Left Side/Tail Lights and No. Plate Lights	3
B3	12 Volt Trailer Electrics (Option)	10
B4	EMS (Battery Feed)	3
B5	ZF Computer (Battery Feed)	7.5
B6	Hazard Warning	10
B7	Beacon and Interior Light	7.5
B8	Radio (24 Volt)	10
B9	Headlight Flash	15
B10	Side Lights	5
C1	Starter Relay Solenoid	3
C2	Cigar Lighter (24 Volt) See Note	10
C3	Blank	-
C4	Rear Wash/Wipe	7.5
C5	Front Wash/Wipe and Horn	10
C6	Heated Seat/Mirrors and Air Suspension Seat (Option)	10
C7	Air Conditioning (Option)	5
C8	Heater Blower	15
C9	Direction Indicators	5
C10	Heated Rear Screen	15
D1	EMS (Ignition Feed)	3
D2	ZF Computer (Ignition Feed)	7.5
D3	CCTV (Option)	5
D4	Blank	-
D5	ESOS and Cold Start Advance	5
D6	Reverse Lights and Alarm	5
D7	In-cab 24/12 Volt Converter (Option)	10
D8	Blank	-
D9	Brake Lights	7.5
D10	Float, Lift and Shovel Reset and 4th Spool	7.5



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