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.

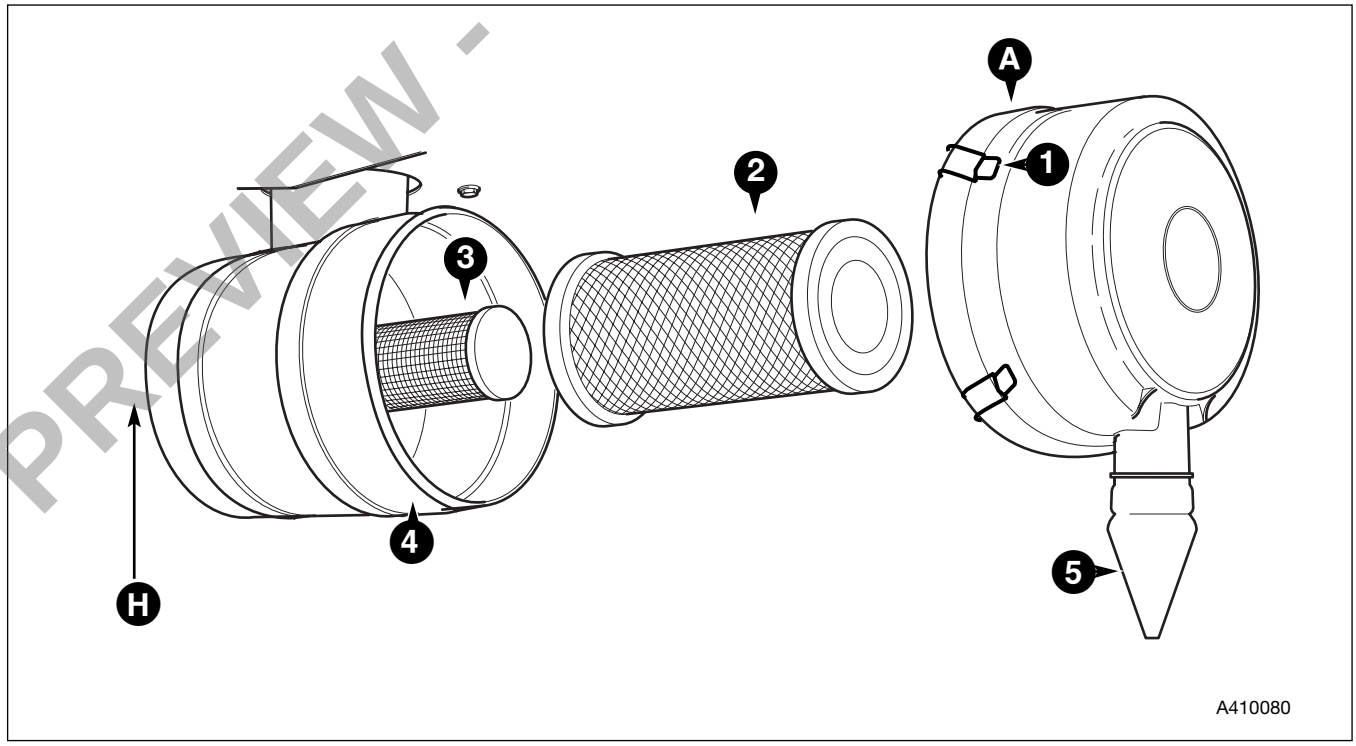
4 Release the end cover spring clips **1** and remove end cover **A**. Pull out the outer element **2**. Take care not to tap or knock the element as you remove it. If necessary, pull out the inner filter **3**.

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.

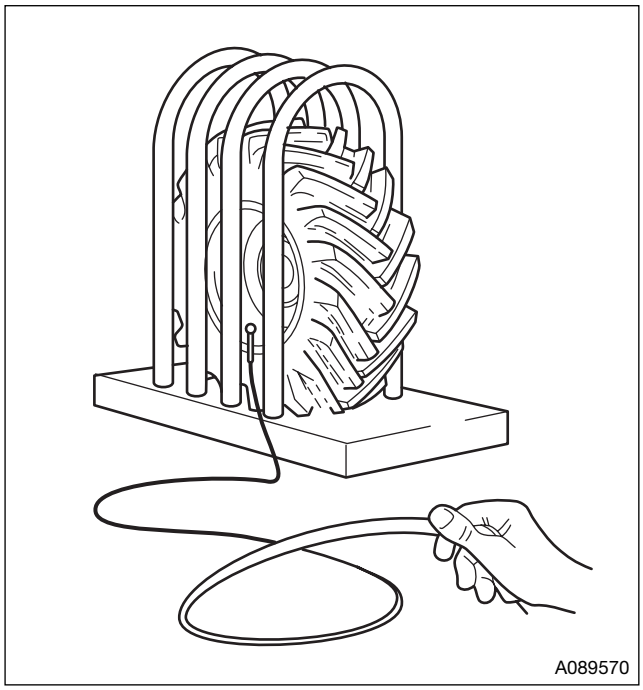
The correct torques are shown in the table below.

414S/416S	
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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ELECTRICAL SYSTEM (continued)

Bulbs

Bulb	Rating (Watts)
Headlights - main	75 W
Headlights - dip	70 W
Indicators	21 W
Indicator repeater	5 W
Instruments	1.2 W
Work lights	70 W Halogen
Number plate light	10 W
Tail lights	5 W
Front side lights	5 W
Interior lights	10 W
Stop lights	21 W
Beacon	70 W Halogen
Rear fog	21 W
Warning lights	1.2 W
Master Warning Light	5 W

WINDSCREEN WASHER

To gain access to the washer bottle **A**, open the left engine cover. The washer bottle is located between the cab and the engine compartment.

Fill the windscreen washer bottle with a suitable liquid. The liquid should contain a de-icing fluid to prevent it freezing. **Do not use engine coolant antifreeze.**

On completion, close and lock the engine cover.

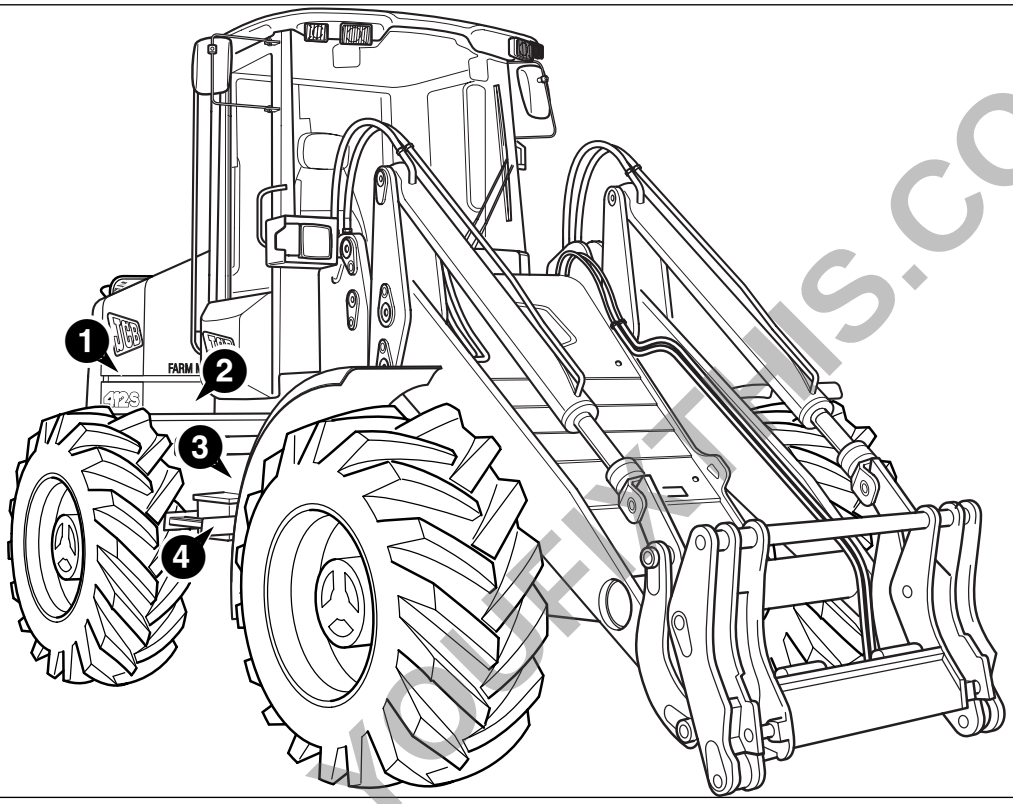


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THE JCB WHEELED LOADER

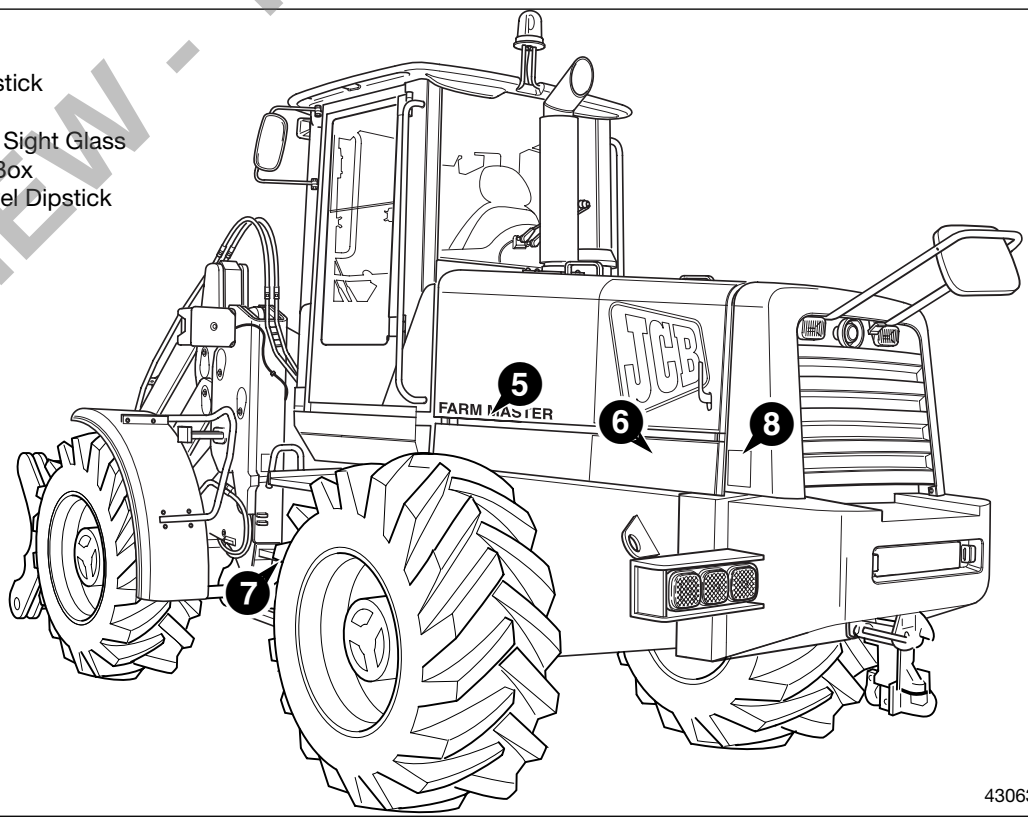
MACHINE DESCRIPTION

Loader: Self-propelled wheeled machine with an integral front mounted shovel-supporting structure and linkage, which loads or excavates through forward motion of the machine, and lifts, transports and discharges material.



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Component Locations



1 Engine Oil Level Dipstick
2 Hydraulic Fluid Filler
3 Hydraulic Fluid Tank Sight Glass
4 Step Mounted Tool Box
5 Transmission Oil Level Dipstick
6 Diesel Filler
7 Articulation Lock
8 Battery/Isolator

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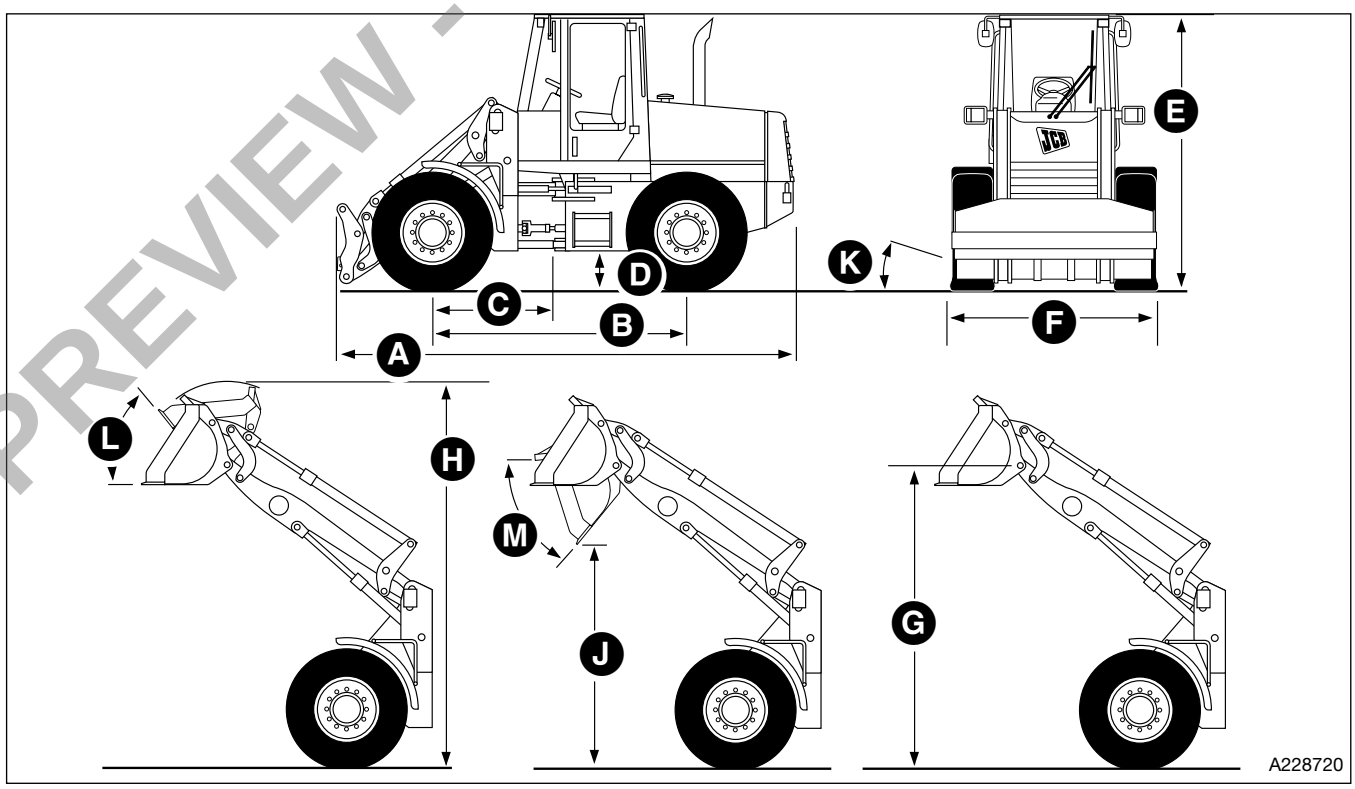
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STATIC DIMENSIONS

		414S			416S		
		mm	ft	in	mm	ft	in
A	Overall length	5648	18	6	6366	20	11
B	Wheelbase	2800	9	2	2800	9	2
C	Centre of Gravity (No attachment fitted)	1412	4	7	1634	5	4
D	Minimum ground clearance	438	1	5	430	1	5
E	Height over cab	2971	9	9	2971	9	9
F	Width (Over tyres- without bulge)	2375	7	9	2375	7	10
G	Pin height (maximum)	3679	12	1	3615	11	10
H	Maximum height	4769	15	8	4549	14	11
J	Load over height	2823	9	3	2676	8	9
K	Axle oscillation	12.5°			12.5°		
L	Roll back angle at full height	58°			58°		
M	Dump angle at full height	47.5°			50°		
	Articulation angle	80°			80°		
		Kg	**lb**		**Kg**	**lb**	
	Weight	8491	18719		9010	22543	

Note: *Dimensions based on a **414S** machine equipped with the standard 1.4 m³ shovel and 19.5LR24 tyres.*
Note: *Dimensions based on a **416S** machine equipped with the standard 1.4 m³ shovel and 19.5LR24 tyres.*



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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**.

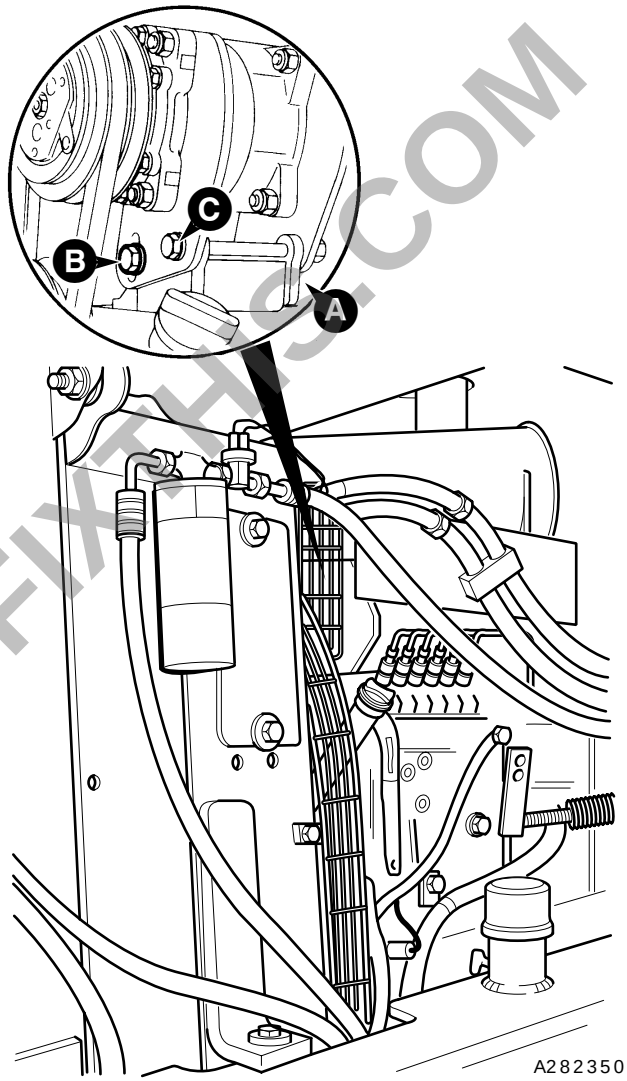
5 Adjust the belt by positioning the compressor to give 5 mm (3/16 in) slack at the mid point of the longest run.

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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DRIVE CONTROLS, SWITCHES AND INSTRUMENTS (continued)

Controls (Continued)

5 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

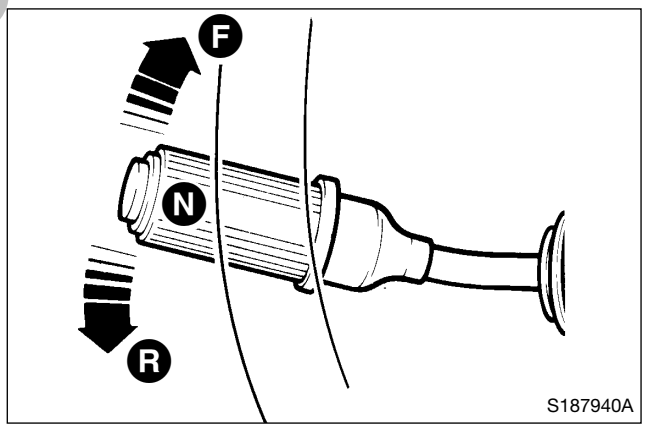
To prevent accidental operation of the forward/reverse lever, while entering or leaving the cab, the lever can be locked in the neutral position.

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

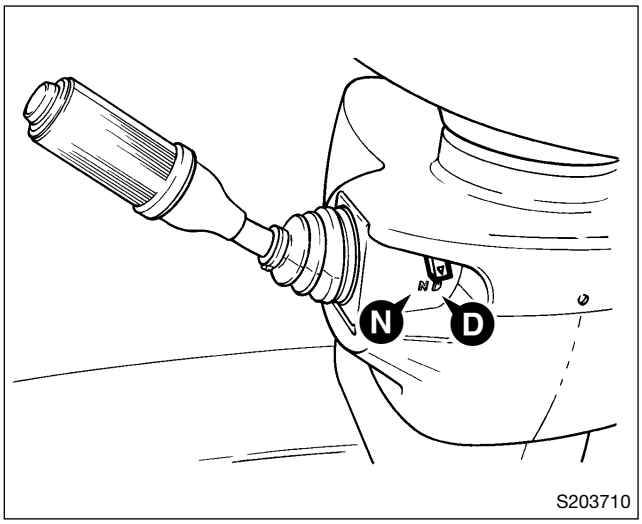
With the selector in the position marked **D**, forward or reverse drive may be selected.

⚠ 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)

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)

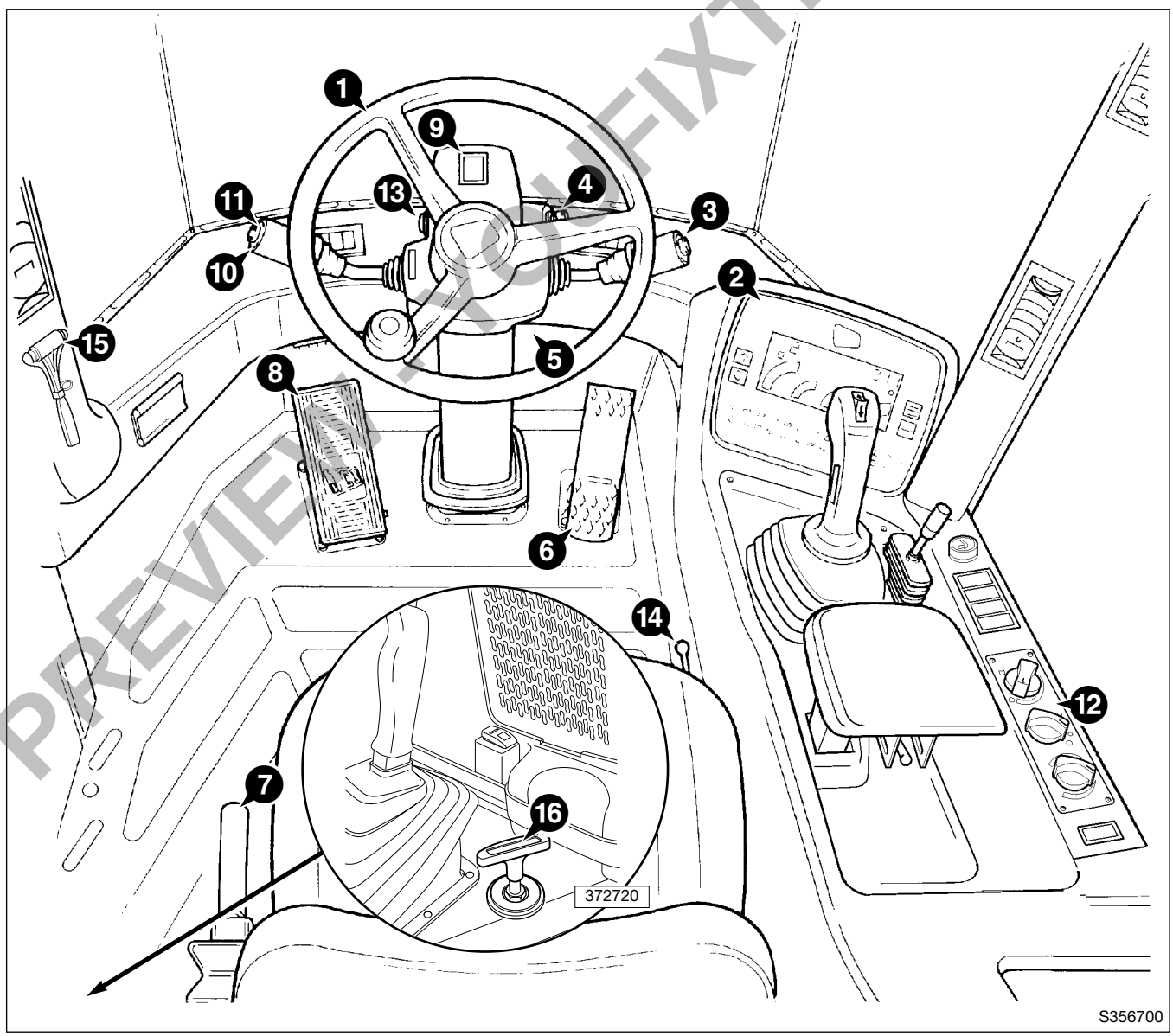
12 Heater Controls (see Page 39)

13 Hazard Light Switch (see Page 31)

14 Loader Controls Lock (see Page 34)

15 Emergency Glazing Breaker (see Page 23)

16 Tow Hitch Lock (see Page 57)



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LOADER CONTROLS

Standard Shovel

1 Loader arm raise.

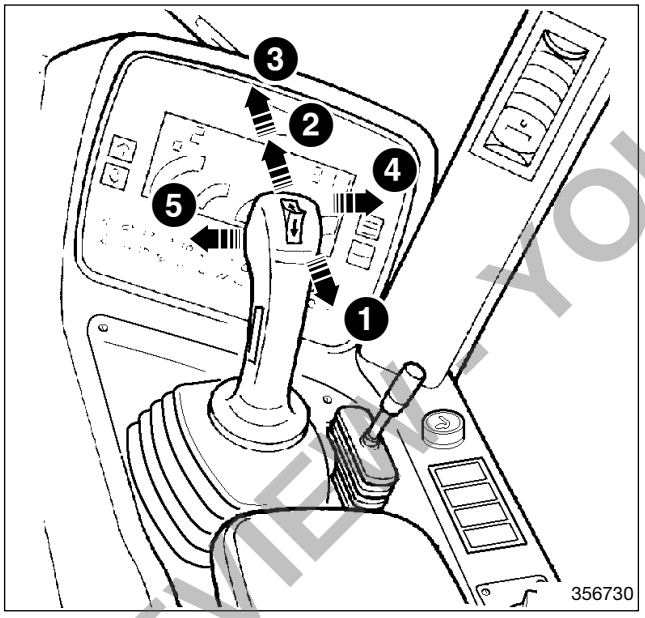
2 Loader arm lower.

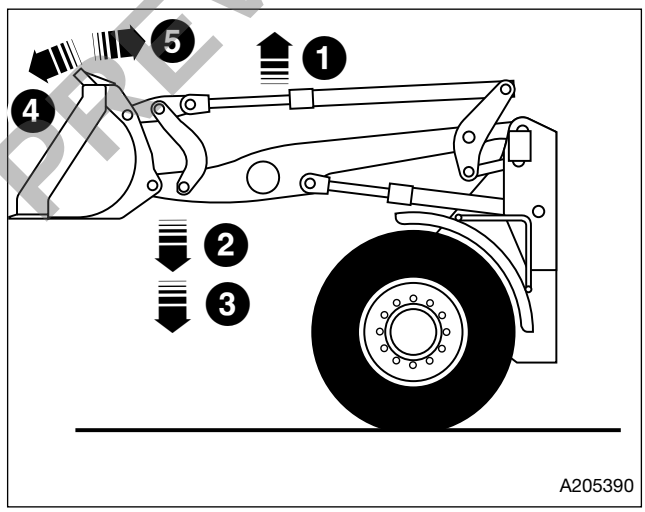
3 Arm float
Push the lever forward as far as it will go, and leave it there.

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

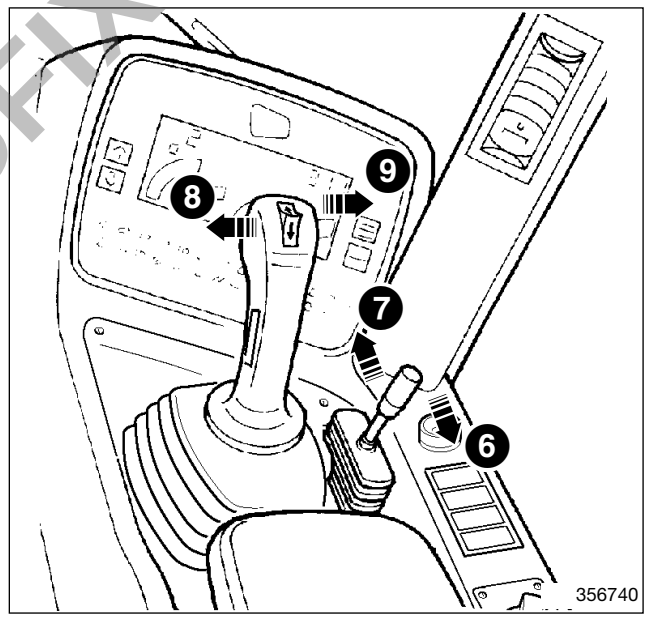
6 Attachment control.

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.

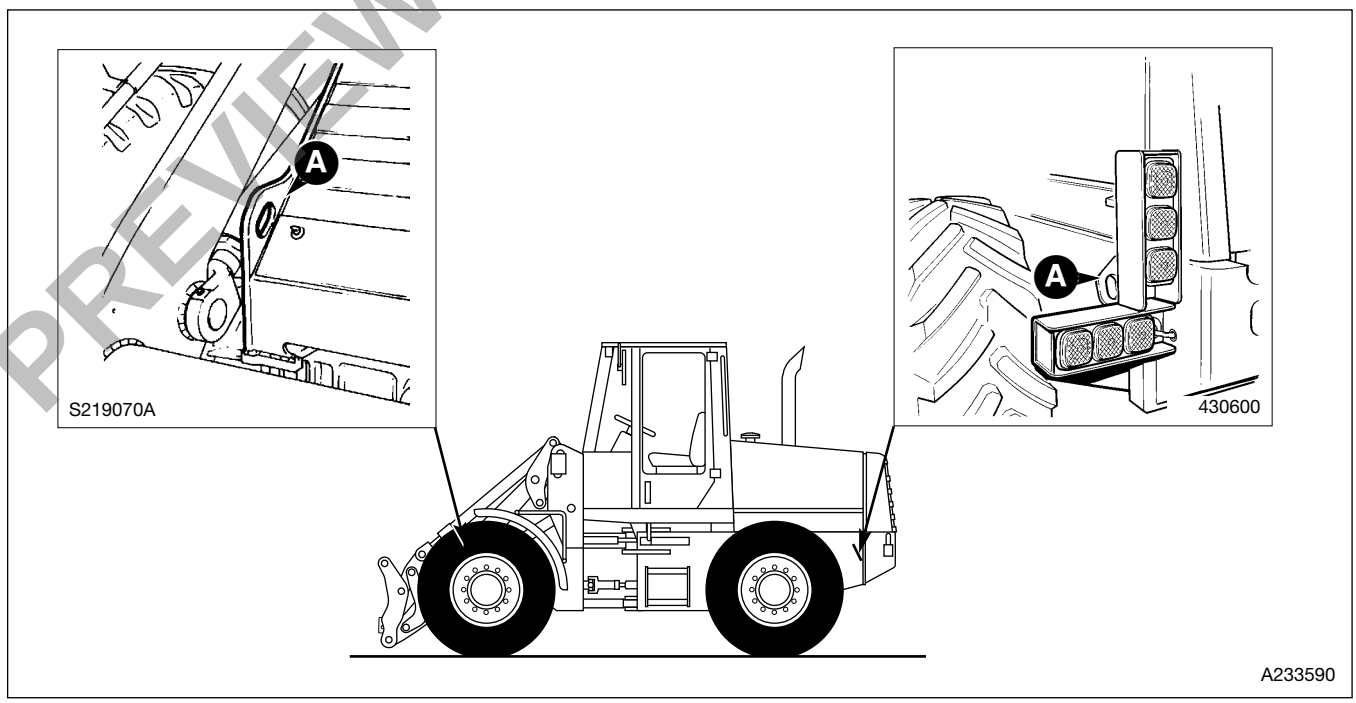
h Install the articulation lock.

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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⚠ 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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