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

⚠ 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

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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BACKHOE CONTROLS
JCB X Pattern (continued)

Dipper and Bucket Movements

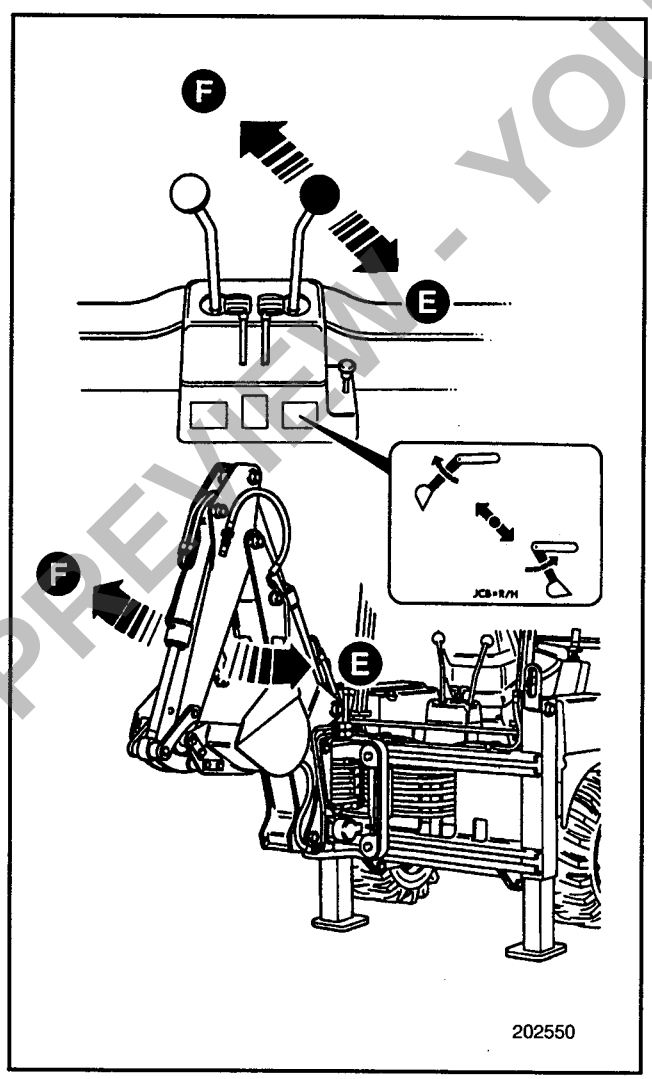
1 To bring the dipper in **E**, pull the lever diagonally right and towards you.

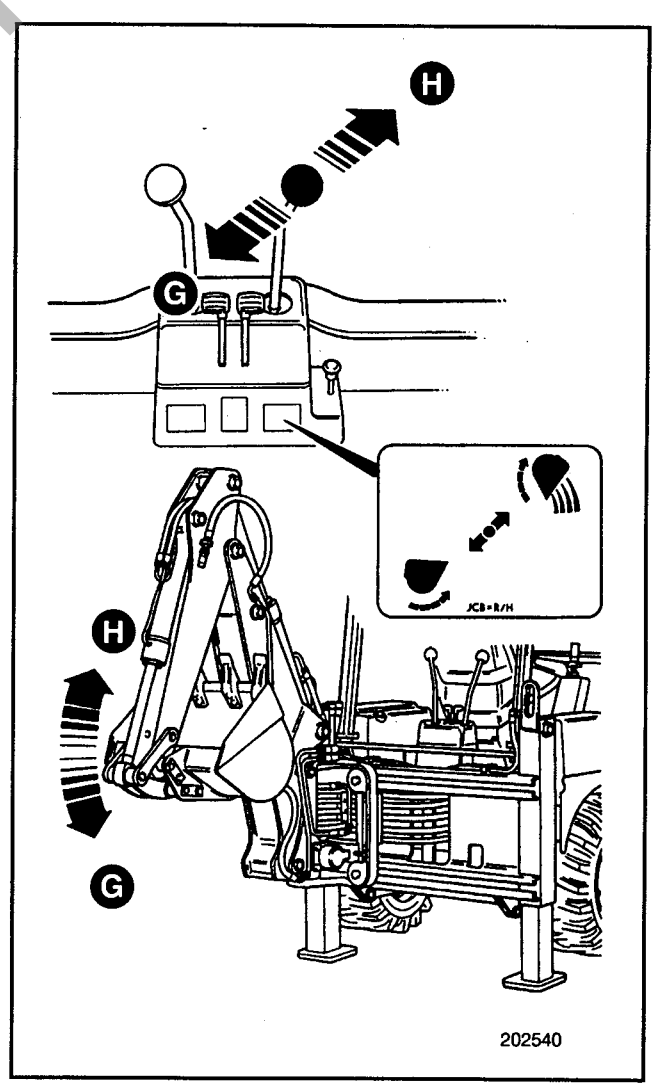
Note: *Some backhoe attachments may collide with the boom if brought too far in. Check this before using different attachments.*

2 To push the dipper out **F**, push the lever diagonally left and away from you. If the boom is already up, check that it is clear overhead before swinging the dipper out.

3 To close the bucket **G** *(say to gather a load)* , pull the lever diagonally left and towards you.

4 To open the bucket **H** *(say to dump a load)* , push the lever diagonally right and away from you.



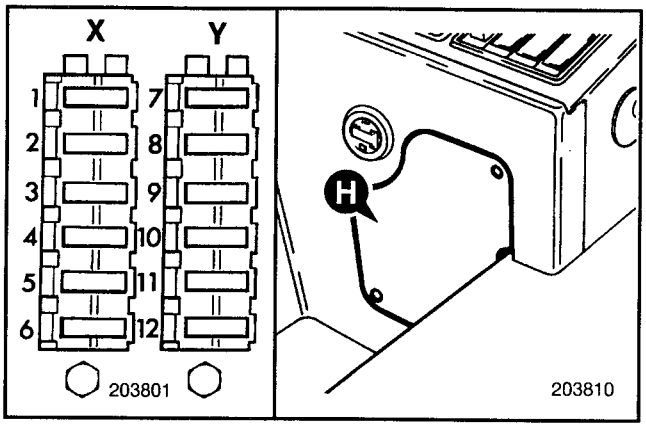


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ELECTRICAL SYSTEM

Fuses

The electrical circuits are protected by fuses. The fuses are located behind panel **H**.

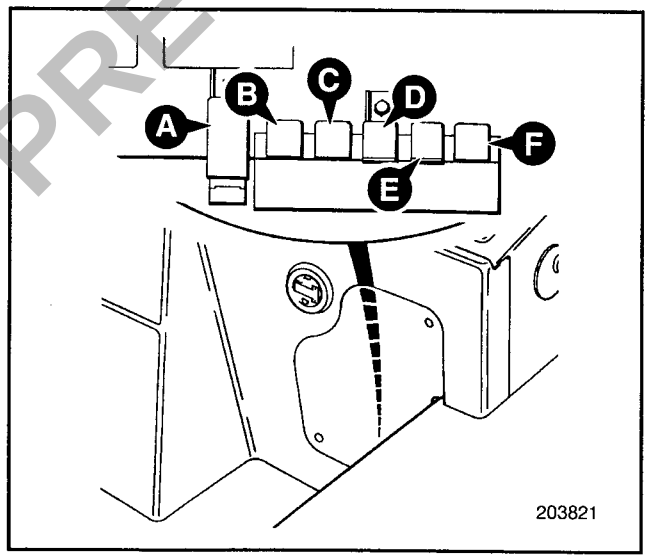


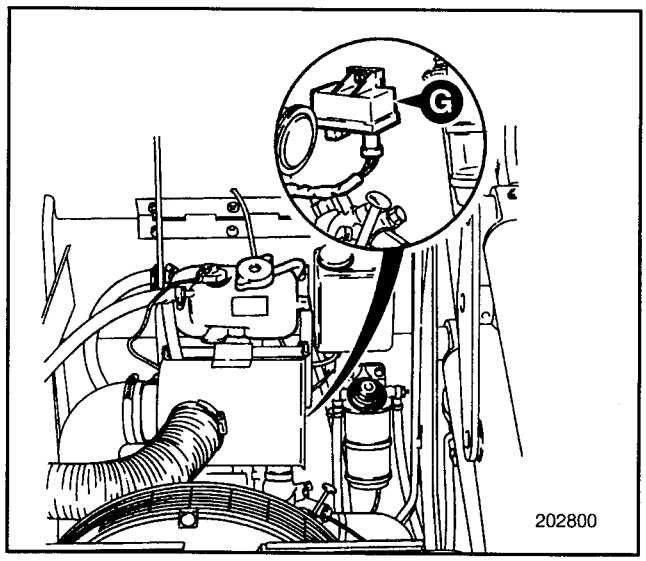
Note: Fuse 2 also supplies, where fitted, Hydraulic Float, Brake Lights and Hi-flow Hydraulics. If any or all of these are fitted, the fuse rating is increased to 15 amps.

Fuse Number	Service	Fuse Size
1	Beacon Sidelights and headlights	10 amp
2	Front worklights (see Note)	10 amp
3	Interlock Relay Pressure reducing solenoid valve	5 amp
4	Auxiliary hydraulics Rear worklights	10 amp
5	Warning lights and buzzer ESOS	5 amp
6	Horn Low coolant warning Stabiliser warning	15 amp
7	Hazard warning Rear wiper Interior light	10 amp
8	Front wiper Washer bottle Direction indicators	10 amp
9	Heater Heated seat	10 amp
10	Reverse alarm Brake light unit	10 amp
11	R. H. front & rear sidelights	5 amp
12	L. H. front & rear sidelights	5 amp

Relays

Overheat Delay Relay	A
Alarm Buzzer	B
Indicator Flasher Relay	C
Neutral Start Relay	D
Loader Isolation Relay	E
Horn Relay	F
Glow Plug Relay	G





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DRIVE CHAIN TENSION

Adjusting the Tension

1 Park the machine on firm level ground.

2 Stop the engine and remove the starter key.

3 Jack-up the left side of the machine, positioning the jack under the centre of the chain case between the wheels. Support the machine on blocks.

Note: *Ensure that the jack is capable of lifting at least 3000 kg (3 tons).*

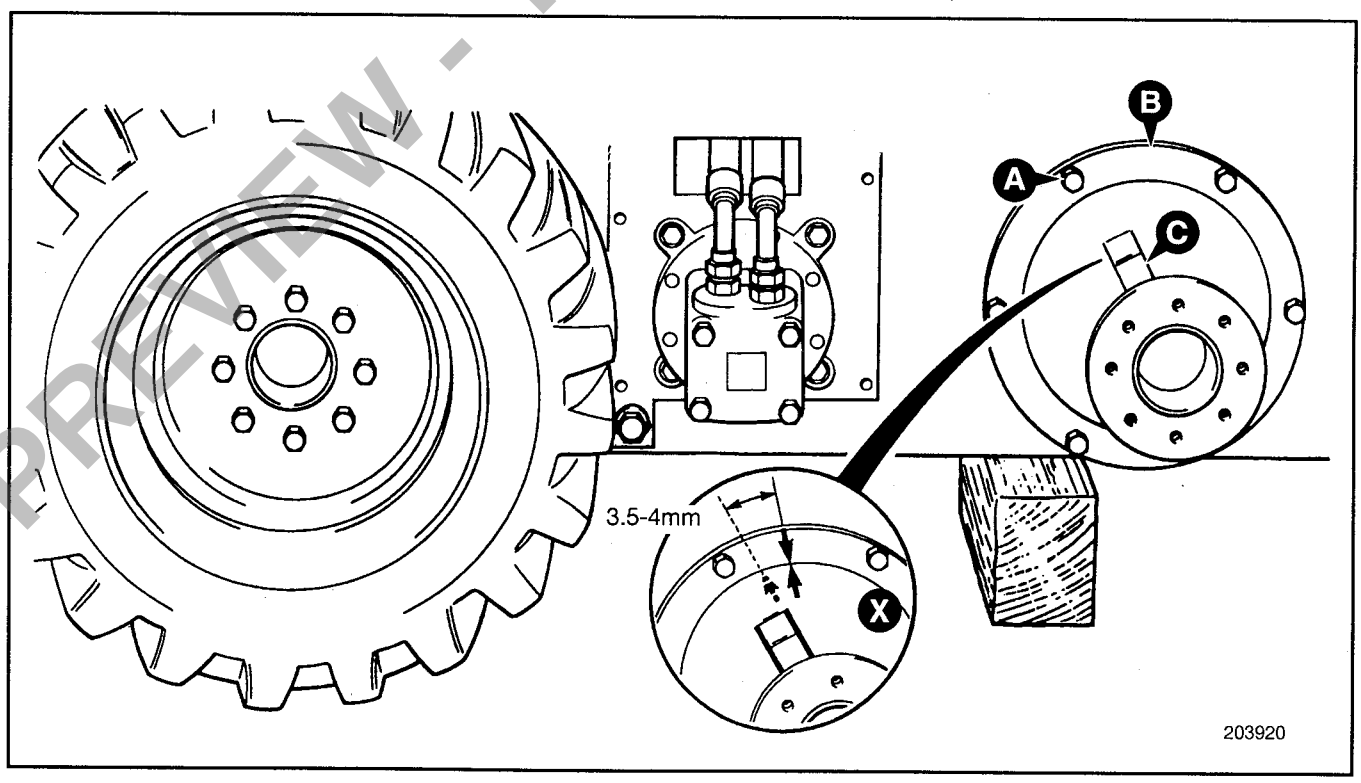
4 Remove the rear wheel.

5 Adjust the tension as described below:
- **a** Loosen the six bolts **A** securing the hub locking ring **B**.
- **b** Using a large adjustable spanner grip the lug on hub **C**, then rotate the hub until no further movement is possible. Mark this position as shown at **X**.
- **c** Slacken the tension with the adjustable spanner until the mark on the hub is 3.5 to 4.0 mm back from that on the locking ring as shown.
- **d** Re-tighten the six bolts of hub locking ring **B** to a torque of 98 Nm (72 lbf ft,10 kgf m).

6 Refit the rear wheel, tightening the bolts to a torque of 220 Nm (162 lbf ft, 22 kgf m).

7 Repeat steps 3 to 6 for the front wheel.

8 Repeat steps 3 to 7 on the right side of the machine.



Note: *This diagram shows the left side rear wheel removed for adjusting the rear axle chain tension. Other wheels are dealt with in a similar manner.*

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NOISE AND VIBRATION DATA

NOISE		CANOPY	CAB
1	Noise Level at Operator's Ear (LpA)	84	85
2	External Noise Level (LwA)	100.8	100.8
VIBRATION		**PNEUMATIC TYRES**	**AIRBOSS TYRES**
3	Weighted rms acceleration : Whole Body (m/s^2)	1.7	2.85
4	Weighted rms acceleration : Hand/Arm (m/s^2)	5.2	3.71

Items 1 and 2 above determined in accordance with static test conditions defined in 86/662 EEC.

Item 3 above is an "Average Equivalent Value" determined from measurement on machines performing typical duties detailed below, with values weighted in accordance with ISO 2631.

Item 4 above measured at the steering control device when machine is travelling over an irregular "Quarry floor" surface, with values weighted in accordance with ISO 2631.

The Vibration values are determined from measurements in three perpendicular planes.

Values determined with standard shovel and excavator bucket fitted.

For information relating to this machine when used with other JCB approved attachments, please refer to the literature accompanying the attachments.

Typical Duties for 1CX machine: Loading cycles
Excavating

TIPPING LOADS

The tipping loads are for the 1CX machine fitted with a JCB approved fork carrier and forks.

	TIPPING LOAD	OPERATING CAPACITY
JCB 1CX	912 kg (2010 lb)	456 kg (1005 lb)

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FUEL SYSTEM (continued)

Draining the Fuel Filter

The fuel filter is located on the rear left hand side of the engine compartment.

1 Stop the engine.

2 Open the bonnet.

3 Drain off any water in the bowl **B** by opening tap **A**.

4 Re-tighten tap **A**.

5 If there is sediment in the bowl **B** change the element **F**. See ***Changing the Fuel Filter Element***.

Changing the Fuel Filter Element

1 Stop the engine.

2 Open the bonnet.

3 Place a receptacle under the filter to catch any fuel. Slacken tap **A**.

4 Support the bowl **B** and unscrew bolt **C**. Remove the bolt **C**, remove and discard washer **D** and 'O' ring **E**.

5 Remove filter element **F**, bowl **B** and base **G** as a unit.

6 Discard 'O' ring **H**.

7 Separate element **F**, bowl **B** and base **G**.

8 Remove and discard seals **J** (3 off), discard 'O' ring **L**.

9 Lubricate all seals and 'O' rings with clean fuel oil.

10 Fit new seals **J** (3 off) to base **G**, bowl **B** and element **F**, fit 'O' ring **H** to the centre of the element **F**.

11 Fit element **F**, bowl **B**, base **G**, to the head **K**.

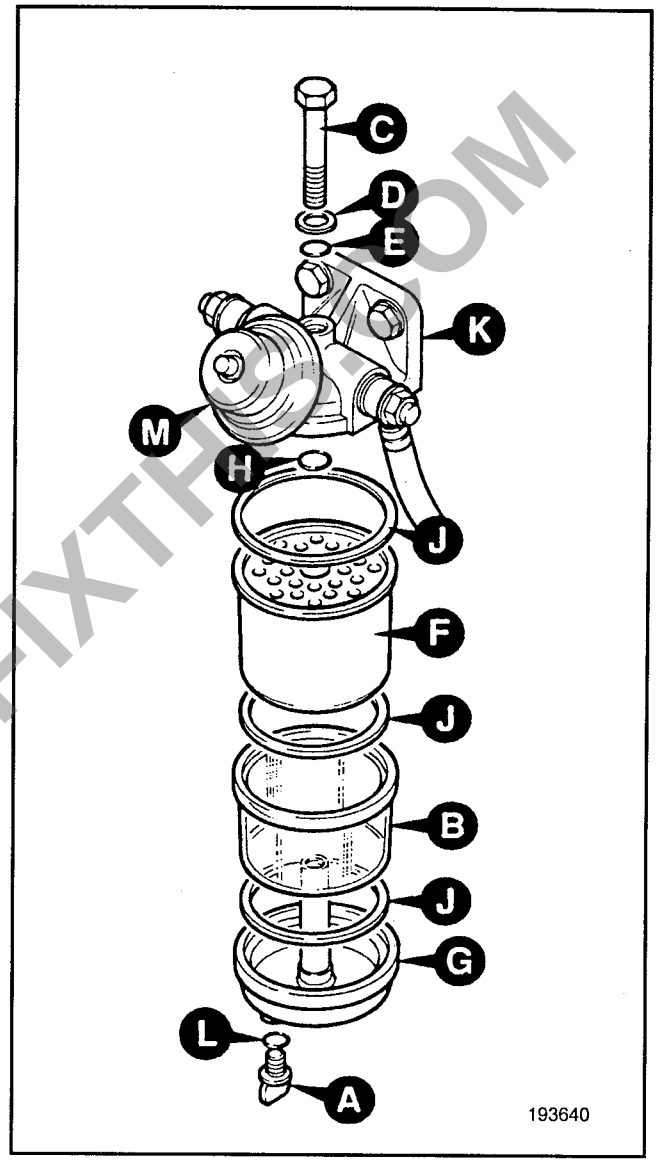
12 Insert centre bolt **C** after fitting new washer **D** and 'O' ring **E**. Tighten the bolt **C** carefully by hand to ensure that all seals are correctly seated. Fit new 'O' ring **L** to tap **A** and insert tap into base **G**.

13 Torque tighten bolt **C** to 8-11 Nm (6-8 lbf ft, 0.8-1.1 kgf m).

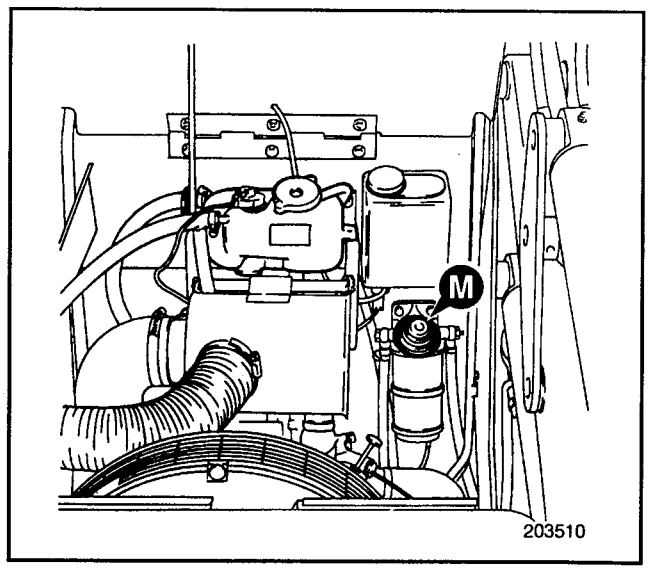
14 Slacken a fuel line connection at the fuel pump on the engine or on the engine side of the priming pump **M**.

15 Prime the fuel pump **M** until fuel spurts from the loosened connection with no entrapped air.

16 Tighten the fuel line connection and check filter for leaks. Tighten connections or change seals as required.



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OPTIONAL ATTACHMENTS

General Purpose Shovel

Width	Capacity	No. of Teeth
1430 mm (56.30 in)	0.29 m^3 (10.25 ft^3)	Nil
1580 mm (62.20 in)	0.32 m^3 (11.30 ft^3)	Nil

Light Duty Shovel

Width	Capacity	No. of Teeth
1430 mm (56.30 in)	0.4 m^3 (14.13 ft^3)	Nil
1580 mm (62.20 in)	0.57 m^3 (20.13 ft^3)	Nil

Note that Light Duty Shovels can only handle material with a bulk density of less than 750 kg/m^3 (46.80 ft^3).

Heavy Duty Shovel

Width	Capacity	No. of Teeth (optional)
1430 mm (56.30 in)	0.29 m^3 (10.25 ft^3)	6
1580 mm (62.20 in)	0.32 m^3 (11.30 ft^3)	6

6-in-1 Shovel

Width	Capacity	No. of Teeth (optional)
1430 mm (56.30 in)	0.29 m^3 (10.25 ft^3)	6
1580 mm (62.20 in)	0.27 m^3 (9.53 ft^3)	6

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JUMP-STARTING THE ENGINE

⚠ 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.

Batteries give off a flammable gas that can explode.

Do not smoke when checking the battery electrolyte levels. When starting from another machine, make sure the two machines do not touch. This prevents any chance of sparks near the battery. Sparks could ignite the battery gas. If that happens the battery could explode.

Even with the starter switch set to off some circuits will be energized when the external power supply is connected. Set all the machine switches to their OFF positions before connecting the external power supply.

Do not connect a booster supply directly across the starter motor. Doing this could bypass the neutral safety switch and the engine can start with the transmission in gear. The machine could then run away and kill or injure bystanders.

Use only booster cables which are in good condition with securely attached connectors. Connect both ends of one booster cable before connecting the other one.
5-2-2-3

1 Make Safe the Loader Shovel

The loader shovel should already be resting on the ground. If it is not you should, if possible, install the safety strut supplied (see ***Installing the Safety Strut*** *in* ***MAINTENANCE*** *section)*. Alternatively, block the shovel to prevent any chance of it falling.

2 Set All Switches In the Cab to Off

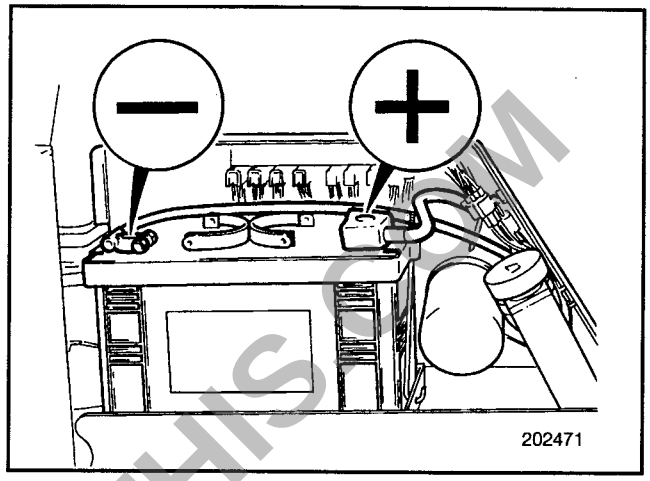
3 Connect the Booster Cables

a Remove the battery compartment cover.

⚠ 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 metalwork. If this happens you can get burned.

Make sure that the fuel filler cap is tightly fitted. Make sure that all spilt fuel is cleaned away from the battery area.
2-2-4-2



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

See Steps 3 to 8 of ***Before Starting the Engine***.

5 Start the Engine

See ***Starting the Engine***.

6 Disconnect the Booster Cables

a Disconnect the negative booster cable from the machine frame earth. Then disconnect it from the booster supply.

b Disconnect the positive booster cable from the positive (+) terminal on the battery. Then disconnect it from the booster supply.

c Refit and secure the battery compartment cover.

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ENGINE COOLING SYSTEM

Coolant Mixtures

To prevent the coolant freezing in cold conditions, antifreeze must be added. Use Inhibited Ethanediol AL-39 antifreeze (JCB Part Number 4006/0200).

Volume of Antifreeze in Coolant Solution	Starts to freeze at
50%	- 37 °C (- 35 °F)

Never use less than 45% antifreeze solution otherwise there will not be enough corrosion protection.

Never use more than 60% antifreeze solution otherwise the cooling system may be damaged.

Leave the antifreeze in all the year round as it gives protection against corrosion.

Check the strength of antifreeze solution at least once a year, preferably at the start of the cold period. Always renew the antifreeze every two years.

A 45% antifreeze solution should be used even if frost protection is not needed. This gives protection against corrosion and raises the coolant's boiling point.

⚠ WARNING

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

7-3-4-4

Checking the Coolant Level

⚠ WARNING

The cooling system is pressurised when the coolant is hot. Hot coolant will burn you. Make sure the engine is cool before checking the coolant level or draining the system.

2-3-3-3

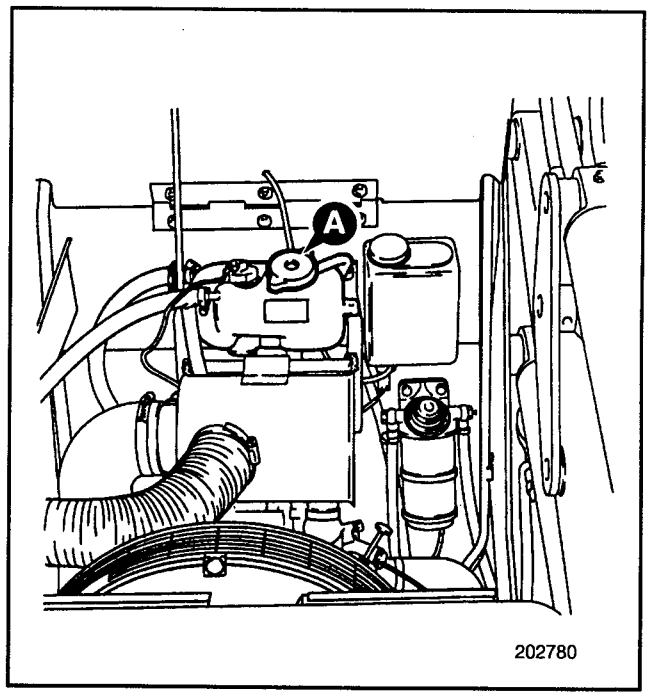
1 Park the machine on level ground. Stop the engine and let it cool down.

2 Raise the bonnet (see ***Engine Compartment Access***). Carefully loosen the cooling system filler cap **A** just enough to let any pressure escape. Remove the cap when all pressure is released.

3 If necessary top up the system to the level indicated inside the expansion/filler bottle.

4 Refit the filler cap and make sure it is tight.

5 Run the engine for a while to raise the coolant to working temperature and pressure. Stop the engine and check for leaks.



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