

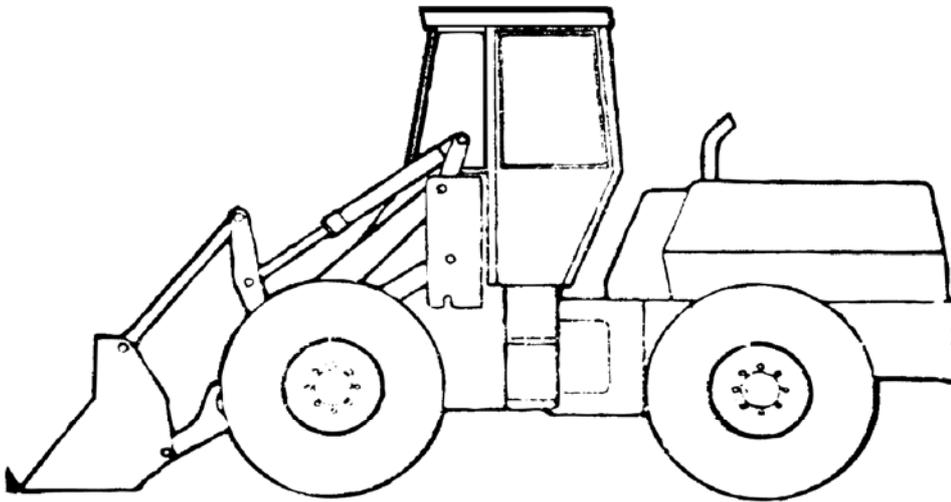
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# Service Manual

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# 430Z Wheeled Loader

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Part No. 550/42385/1



A product  
of Hardwork



# Service Manual

## 430Z Wheeled Loader Shovel

### Published by

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## INTRODUCTION

This publication is designed for the benefit of JCB Distributor Service Engineers who are receiving or have received training by the JCB Technical Training Department.

It is assumed that these personnel have a sound knowledge of good workshop practice, safety procedures and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment. Therefore these basic subjects being to convey only more specialised information concerning particular aspects of the machine or components.

For example, renewal of oil seals, gaskets, etc. and any component showing obvious wear or damage is expected as a matter of course, and therefore information of this nature is included in the context of specialised procedures or where a range of wear tolerances is required. Similarly it is expected that components will be cleaned and lubricated where appropriate, also that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt.

For convenience the manual is compiled in sections, e.g. "Hydraulics", "Electrics" etc.

Illustration which show a dismantled component are numbered as a guide to the dismantling sequence, which generally can be reversed for assembly.

Torque settings are given as a 'mean' figure which may be varied by + or -3% Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third.

'Left Hand' and 'Right Hand' are as viewed from the rear of the machine looking forward.

## TONE CODING

The following coding is used on hydraulic circuit illustrations with no colour, to denote various conditions of oil pressure and flow.

1. Neutral Circuit Pressure.
2. Pressure generated by the operation of a service. Depending on application, this may be anything between neutral Circuit Pressure and MRV Operating Pressure.
3. Pressure that is above neutral pressure but lower than that denoted by 2.
4. Exhaust.

### **⚠ WARNING** **Asbestos**

Asbestos dust can damage your lungs. Some engine joints and gaskets may contain asbestos. Take the following precautions when working on them.

1. Wear a face mask and gloves.
2. Work in a well ventilated area and do not smoke.
3. Do not use a rotary wire brush, use a hand scraper.
4. Make sure the material to be removed is wet with oil or water to contain loose particles.
5. Place all material into plastic bags and dispose of in accordance with local regulations.

### Colour Coding

The following colour coding, used on illustrations to denote various conditions of oil pressure and flow, is standardised throughout JCB Service Publications.



Blue : Neutral Circuit Pressure.



Light Green : Oil subjected to a partial vacuum due to a drop in pressure (cavitation).



Red : Pressure generated by the operation of a service. Depending on application this may be anything between Neutral Circuit Pressure and M.R.V. Operating Pressure.



Yellow : Oil trapped within a chamber or line, preventing movement of components (lock - up).



Pink : Pressure that is above Neutral Circuit Pressure but lower than that denoted by Red.



Orange : Oil pressure used in a controlling circuit Pressure but lower than device (servo).



Green : Exhaust.

# **SECTION 2**

## **CARE & SAFETY**



## SAFETY NOTICES

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.

### **WARNING**

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

### **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.

All construction and agricultural equipment can be hazardous. When a JCB 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.

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

### **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.

### **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.

### **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.

### **WARNING**

#### **Lifting Equipment**

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.

### **WARNING**

#### **Raised Attachments**

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

## 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 handbook are completed before using the machine.

### **WARNING** **Controls**

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

### **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.

### **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.

### **WARNING** **Engine**

The engine has rotating parts. Do not open the engine cover while the engine is running. Do not use the machine with the cover open.

### **WARNING** **Entering/Leaving**

Always face the machine when entering and leaving

the cab. Use the step(s) and handrails. 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 hand holds, use the handrails.

### **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. Get out of the cab into fresh air.

### **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.

### **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.

### **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.

### **WARNING**

The transmission is in 4 wheel drive. If the machine is to be raised and the engine/transmission run, make sure all four wheels are off the ground and

supported by axle stands. If only the rear wheels are raised, the machine could still drive through the front axle.

## MAINTENANCE SAFETY

### **WARNING** Repairs

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.

### **WARNING** Modifications and Welding

Non-approved modifications can cause injury and damage. Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Contact your JCB distributor for advice before modifying the machine.

### **WARNING** Metal Splinters

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

### **WARNING** Electrical Circuits

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

### **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.

### **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.

### **WARNING** Battery

A battery with frozen electrolyte can explode if it is used or charged. Do not use a machine with a frozen battery. To help prevent the battery from freezing, keep the battery fully charged.

### **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.

### **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.

### **WARNING** Hydraulic Fluid

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close

to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, get medical help immediately.

**⚠ DANGER**  
**Hydraulic Pressure**

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the engine and operate the controls to release pressure trapped in the hoses. Make sure the engine cannot be started while the hoses are open.

**⚠ WARNING**  
**Diesel Fuel**

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.

**⚠ 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.

**⚠ WARNING**  
**Soft Ground**

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

**⚠ 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.

**⚠ WARNING**  
**Hot Coolant**

The cooling system is pressurized when the engine is hot. Hot coolant can spray out when you remove the radiator cap. Let the system cool before removing the radiator cap. To remove the cap; turn it to the first notch and let the system pressure escape, then remove the cap.

**⚠ 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.

**⚠ 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.

**⚠ CAUTION**  
**Cleaning**

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

**⚠ CAUTION**  
**'O' rings, Seals and Gaskets**

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakage, and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

**⚠ WARNING**  
**Fires**

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the operator's cab 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.

**⚠ WARNING**  
**Jacking**

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

**⚠ WARNING**  
**Hydraulic Hoses**

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:

- Damaged end fittings
- Chafed outer covers
- Ballooned outer covers
- Kinked or crushed hoses

Embedded armouring in outer covers.

Displaced end fittings.

**⚠ WARNING**  
**Safety Strut**

Raised loader arms can drop suddenly and cause serious injury. Before working under raised loader arms, fit the loader arm safety strut.

**⚠ WARNING**

A raised and badly supported machine can fall on you. Position the machine on a firm, level surface before raising one end. Ensure the other end is securely chocked. Do not rely solely on the machine hydraulics or jacks to support the machine when working under it.

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

**⚠ WARNING**

**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.

**⚠ WARNING**

Make the machine safe before working underneath it. Park the machine on level ground' lower the arms. Apply the parking brake, put the transmission in neutral and stop the engine. Chock both sides of all four wheels.

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

**⚠ WARNING**

To avoid burning, wear protective gloves when handling hot components. To protect your eyes, wear goggles when using a wire brush to clean components.

**⚠ WARNING**  
**Fluoroelastomeric Materials**

\* 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 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 (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 Ensure that components have cooled then remove and place material into plastic bags.
- 2 Thoroughly wash contaminated area with 10% calcium hydroxide or other suitable alkali solution, if necessary use wire wool to remove burnt remains.

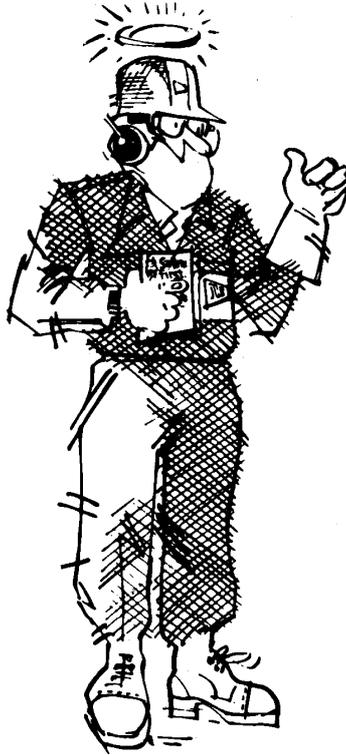
3 Thoroughly wash contaminated area with detergent and water.

4 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.**

If contamination of skin or eyes occurs, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Get medical attention immediately.

## PERSONAL SAFETY



**Note :** Before towing the machine, it is advisable to disconnect front and rear propshafts to avoid damage to the transmission.

### PERSONAL SAFETY

As an operator, we know your common sense will avoid most accidents, but always be prepared for one to happen.

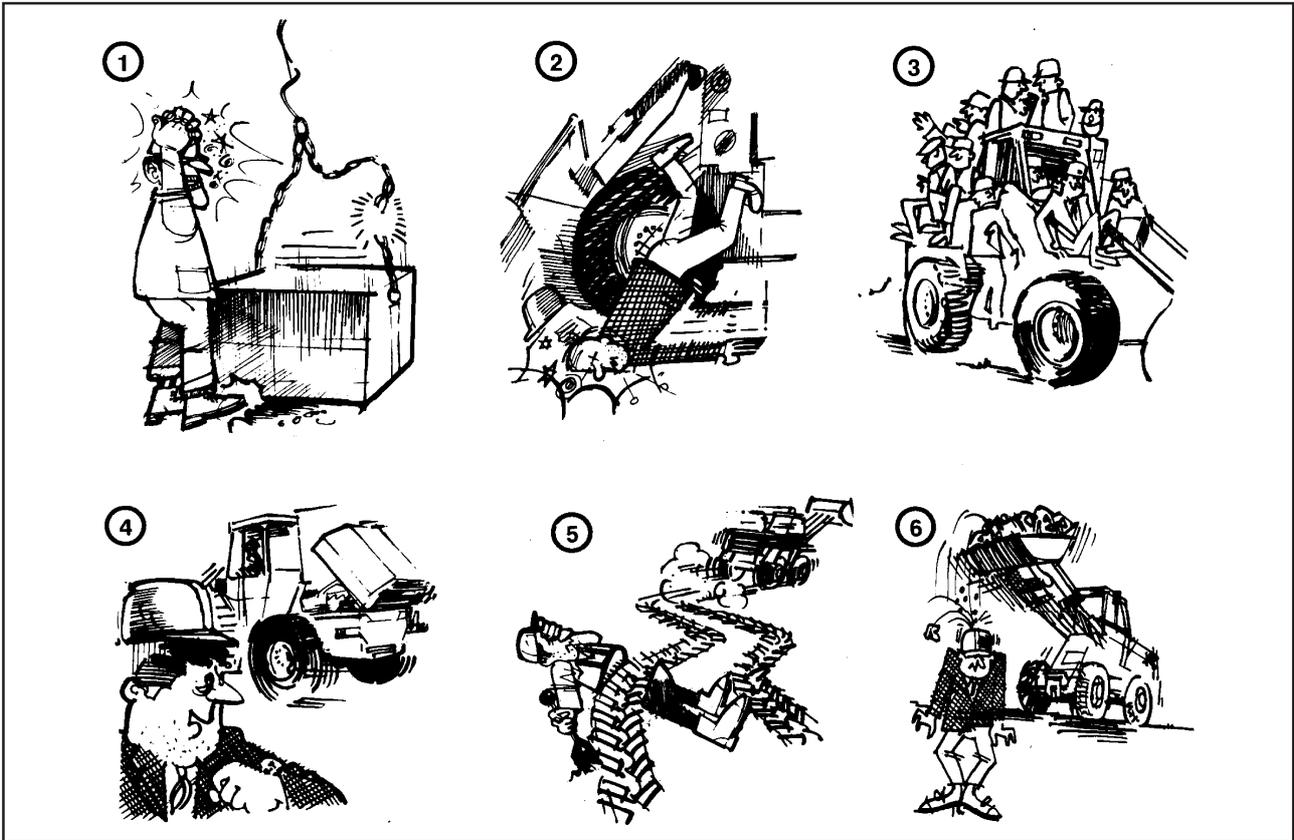
### PROTECTION

Always wear the right clothing for the job. Wear safety shoes or wellingtons with reinforced toe-caps, a hard hat and zip up overalls without a belt.

**Never** wear loose clothing that can get caught up in moving machinery.

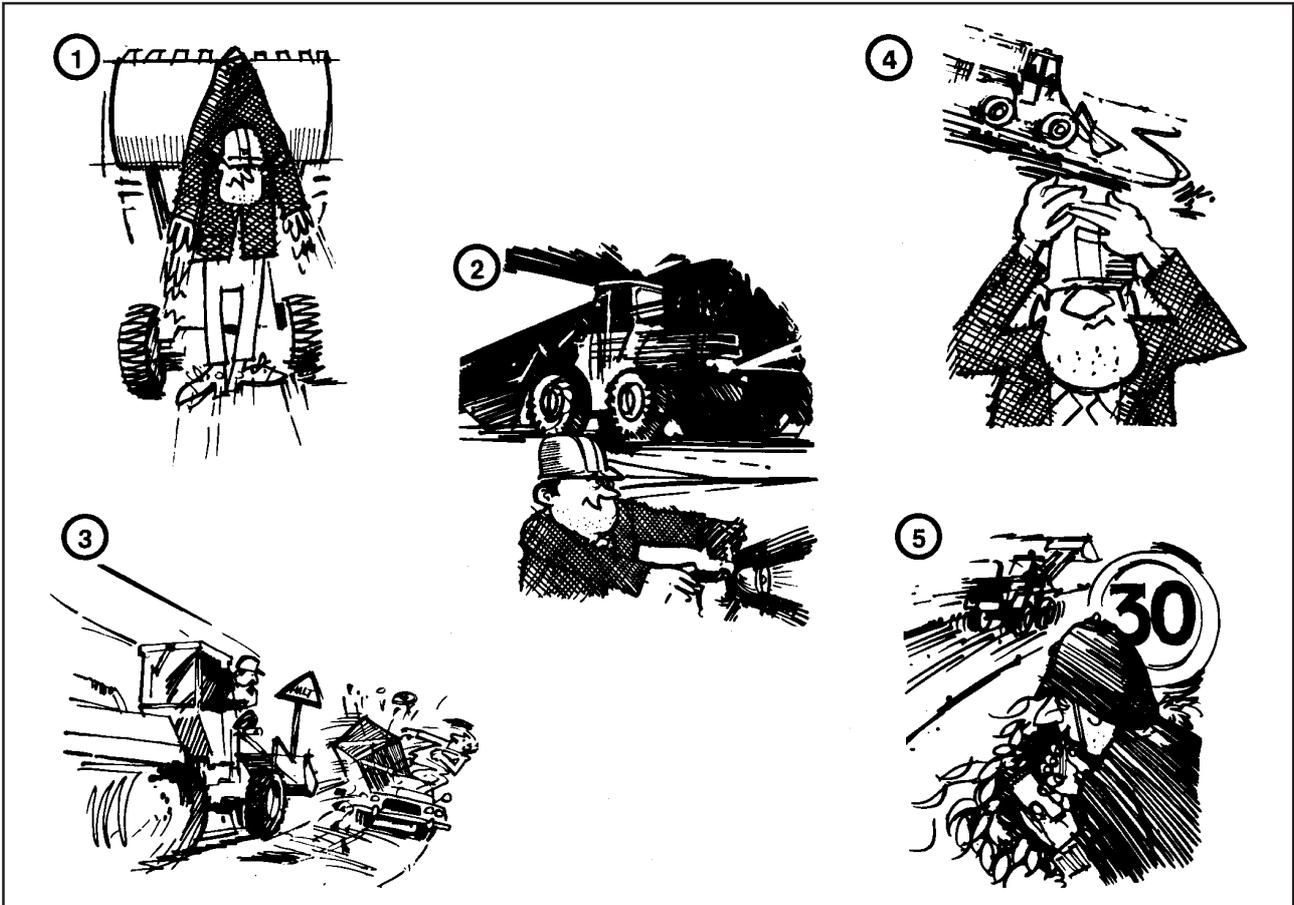
To protect your hands use a barrier cream and wash them without scrubbing.

## OPERATOR SAFETY



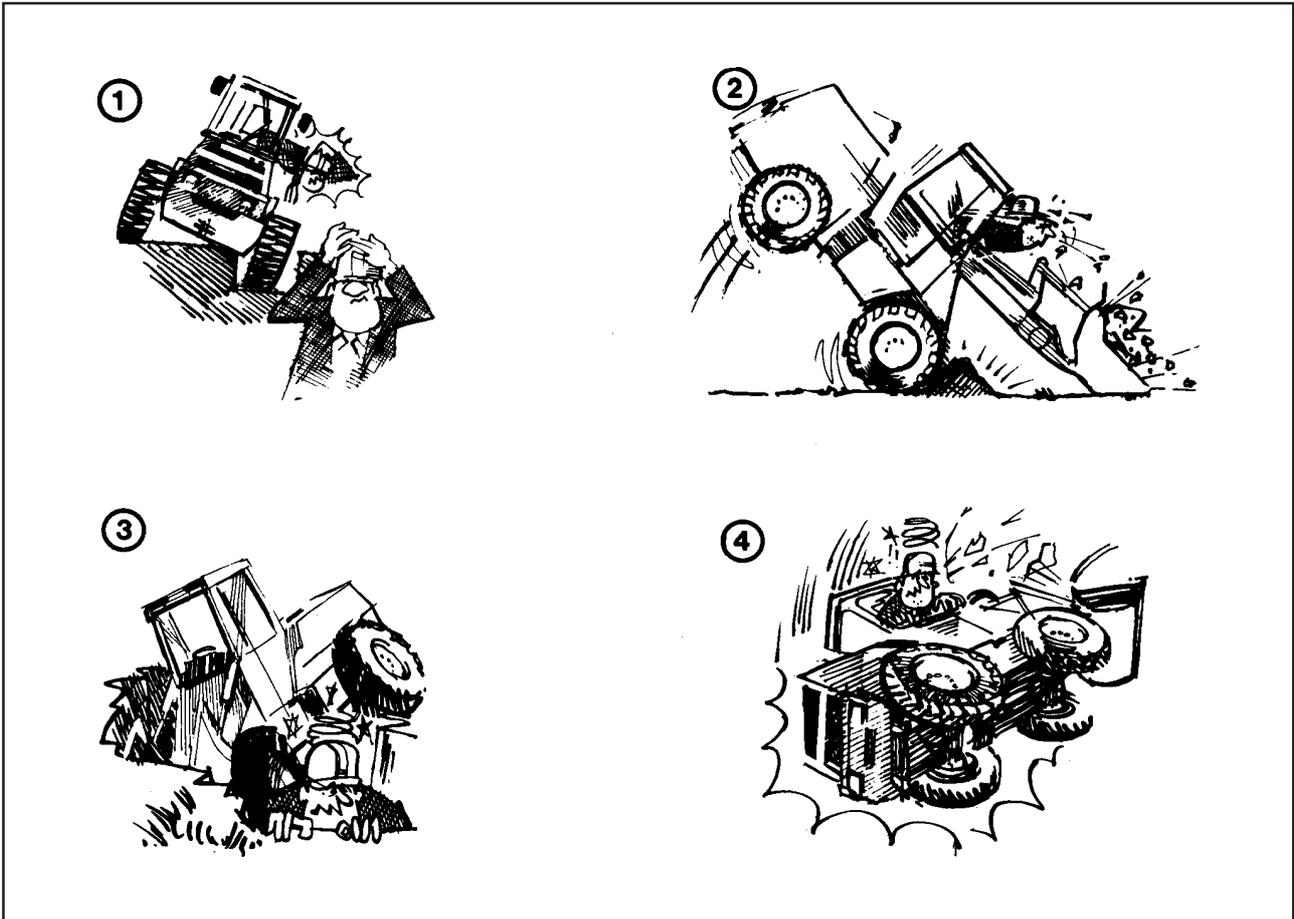
- 1 Check lifting equipment before using.
- 2 Always face machine when descending from cab.
- 3 Do not carry passengers,
- 4 Never travel with engine bonnet raised.
- 5 Do not operate controls from outside cab.
- 6 Jerking machine can cause spillage from bucket.

## OPERATOR SAFETY



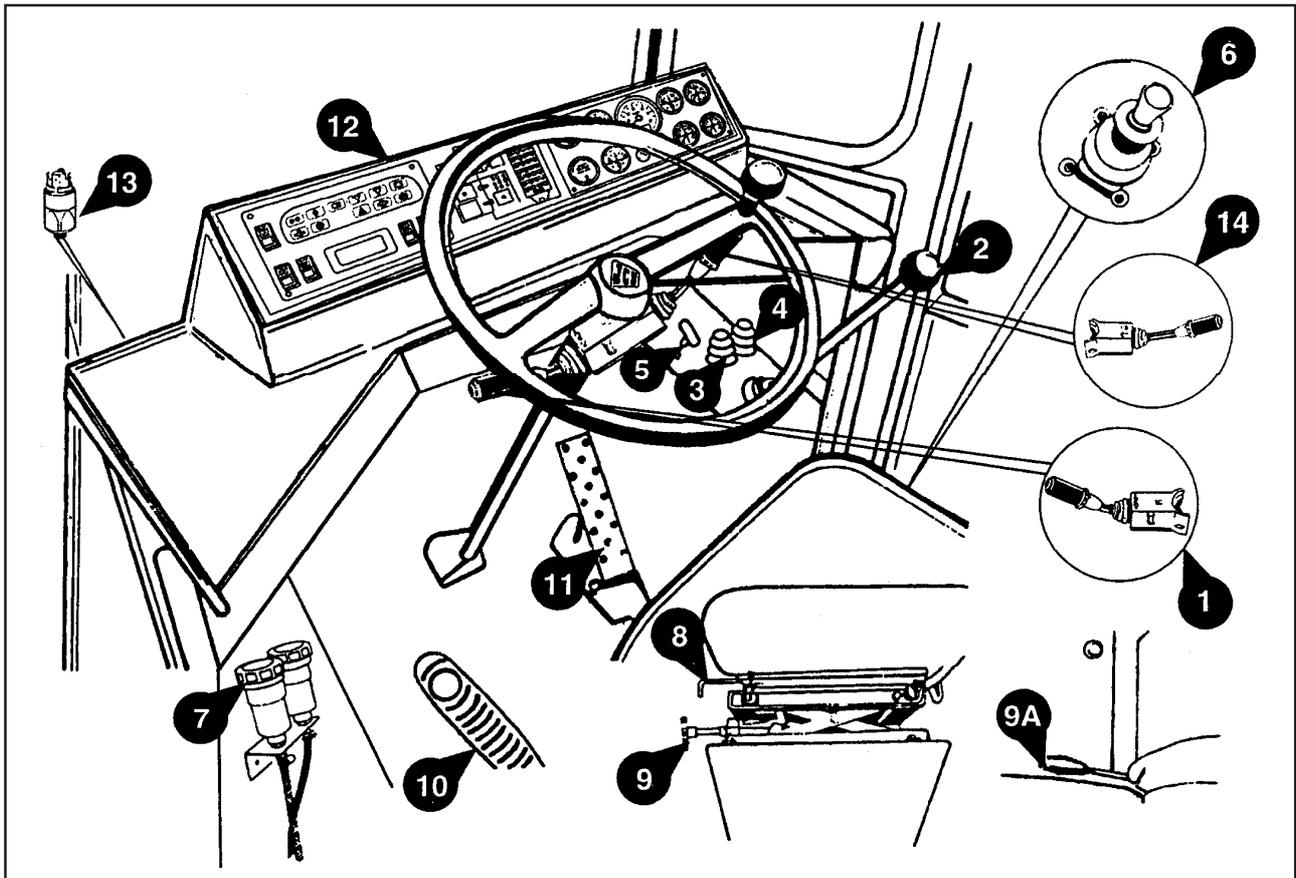
- 1 **Secure** all moving parts of the machine when not in use.
- 2 **Always** ensure electrics are switched off before leaving machine.
- 3 **Always** drive carefully and avoid any sudden stops and changes of direction.
- 4 On leaving the machine **Always** stop the engine.  
When parking **Always** rest machine bucket on the ground and apply handbrake.  
**Avoid** parking on slopes-if it is necessary ensure parking brake is on and wheels are chocked.
- 5 Avoid high speed operation.

## OPERATOR SAFETY



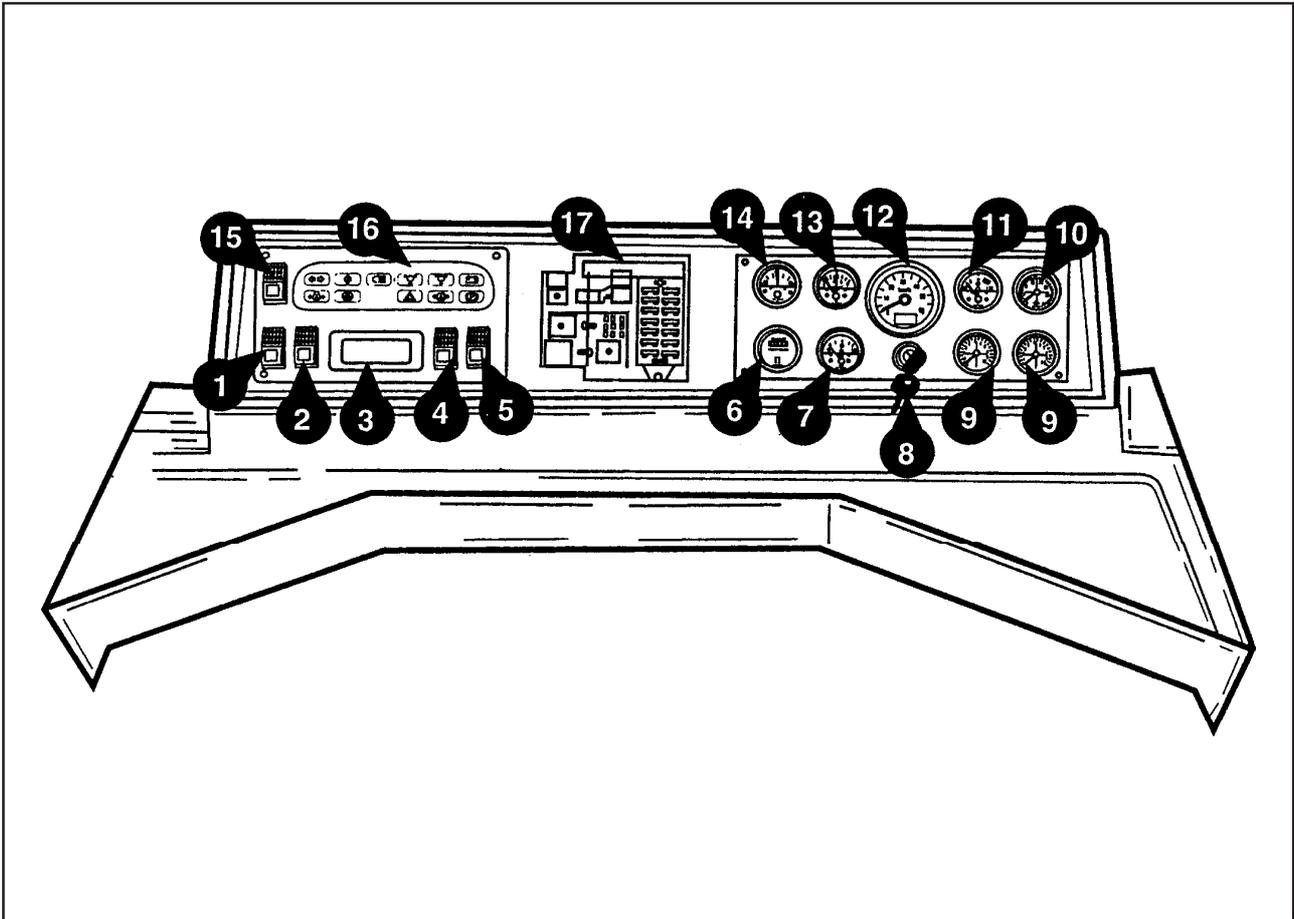
- 1 Do not drive near the edge of a hole or trench.
- 2 Keep bucket about 457 mm (18 in.) above the ground when :—
  - Travelling with a full bucket.
  - Reversing up a gradient.
  - Travelling across a gradient.

## CAB LAYOUT



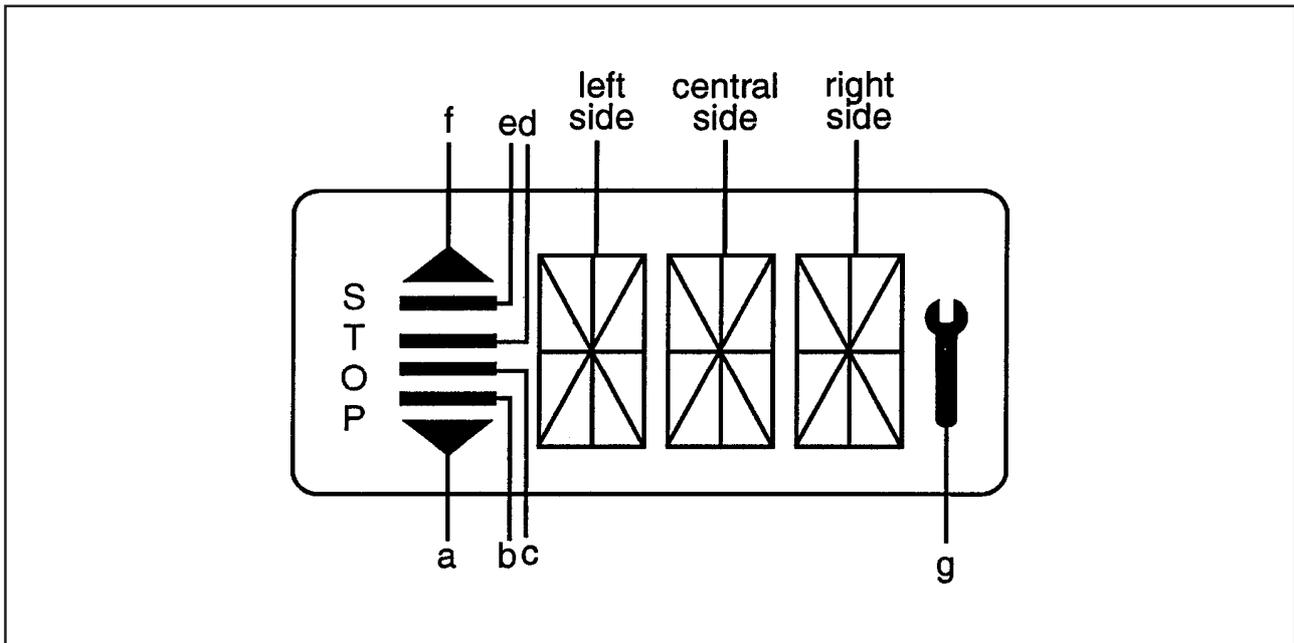
- 1 Range selector-4 Forwards, 3 Reverse
- 2 Loader arm/bucket control lever/loader dump switch
- 3 Aux. hydraulic control (optional)
- 4 Aux. hydraulic control (optional)
- 5 Stop control
- 6 Parking brake switch
- 7 Brake fluid reservoir
- 8 Seat adjustment—Sliding
- 9 Seat adjustment—Height
- 9A Seat adjustment—Back rest
- 10 Brake Pedal
- 11 Accelerator pedal
- 12 Instrument Panel
- 13 Declutch switch connected to Rear Master Cylinder
- 14 Combination switch

## INSTRUMENT PANEL



- 1 Hazard Switch
- 2 Head Light Switch
- 3 Electronic Display Unit. (Refer Page No. 7-8)
- 4 Work Light Switch
- 5 Rev. Horn Switch
- 6 Hour Meter
- 7 Transmission Temp.
- 8 Ignition Key
- 9 Air Pressure Gauges (Front & Rear)
- 10 Transmission Pressure
- 11 Water Temp. .
- 12 Speedo Meter-Cum-Odometer
- 13 Engine Oil Pressure
- 14 Ammeter
- 15 Automatic / Manual Switch for Transmission
- 16 Audio Visual Indications (Ref. Page No.9)
- 17 Relays and Fuses (Ref. Page No. 10)

## ELECTRONIC DISPLAY UNIT



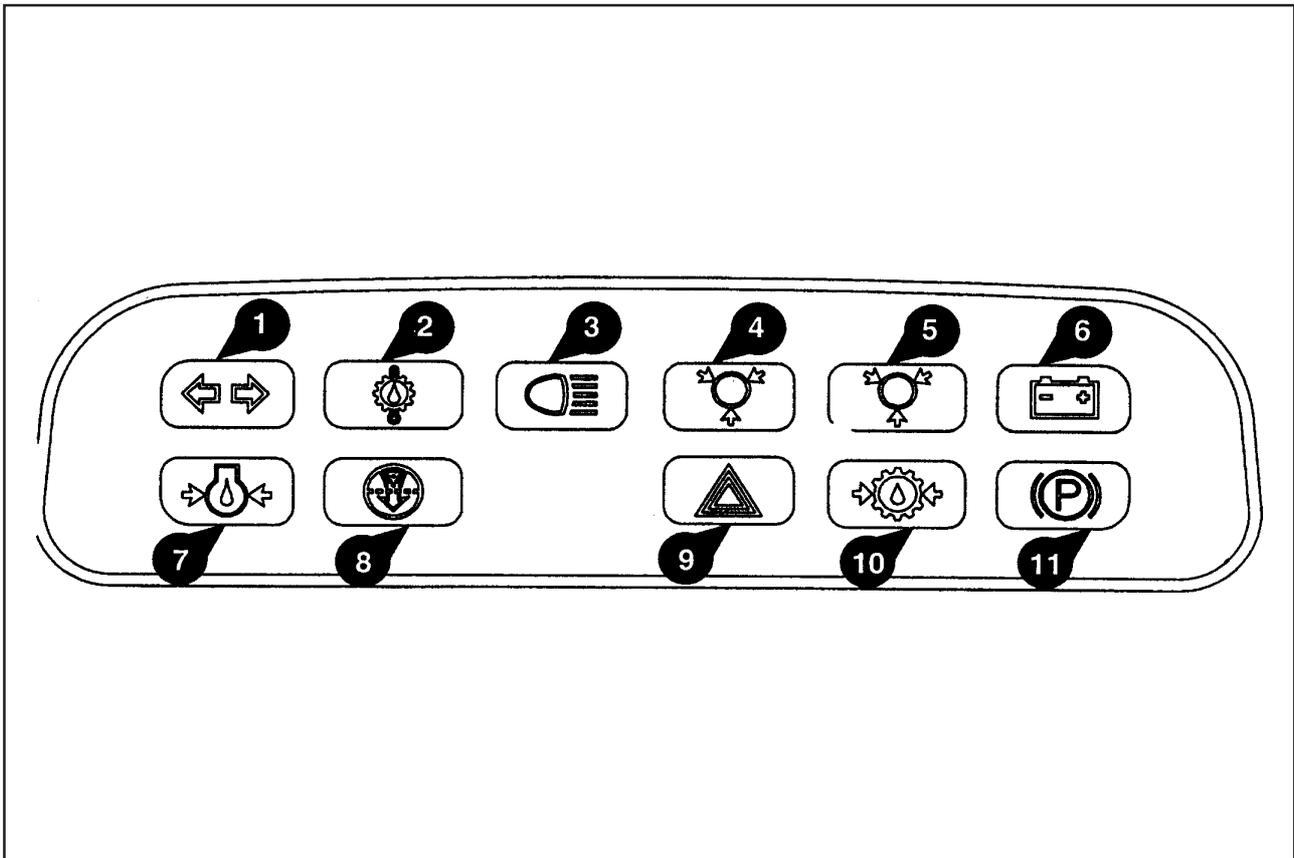
Spec. Character	Display
a f	Automatic range (up and down shifting)
b, c, d, e	Preselected gear
g	Flashes in case of an error
Central and Right Side	On the two alphanumeric 16-segment displays, it indicates the actual state of gear and driving direction. Besides, a two-digit error code will be indicated via these two segments.

Symbol	Meaning
1F, 1R	Actual gear and direction
2F, 2R	Left digit shows actual gear
3F, 3R	Right digit shows actual direction
4F	
SF .	
6F	
LF, LR	Limp home gear
F or R, no gear	Clutch Cutoff .
F or R, flashing	Direction F or R selected while turbine speed is too high
NN	Not neutral, .waiting for neutral after power up or a severe fault
**	Oil temperature too low, no gear available
*N	Oil temperature low, only one gear available.

## ELECTRONIC DISPLAY UNIT

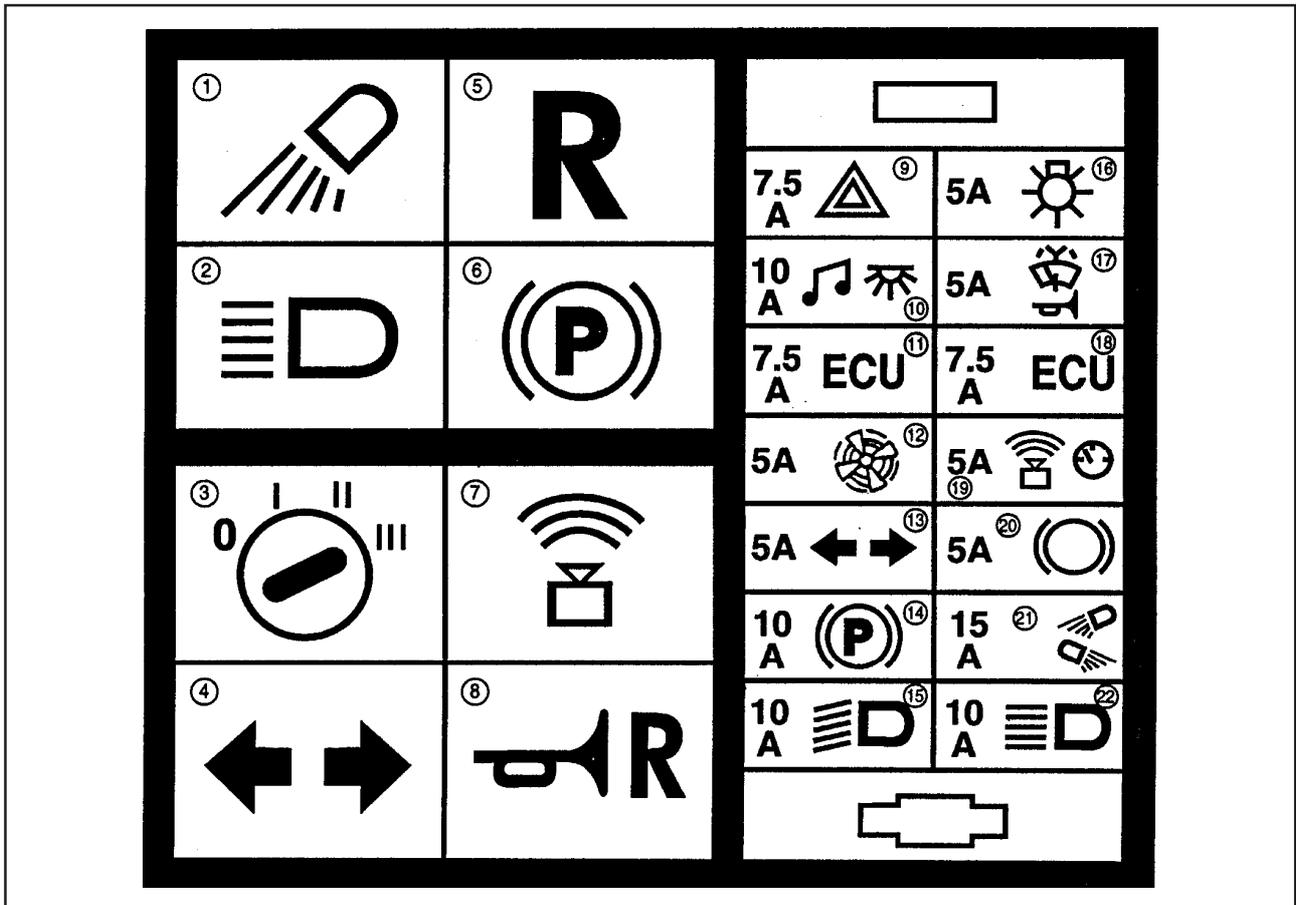
Symbol	Meaning
1 bar (special symbol)	Manual mode 1st gear
2 bars	Manual mode 2nd gear
3 bars	Manual mode 3rd gear
4 bars	Manual mode 4th gear
4 bars and 2 arrows	Automatic mode
Spanner	At least one fault active
WS	Warning sump temperature
WR	Warning retarder temperature
WT	Warning torque converter temperature
WE	Warning high engine speed
PN	Direction F or R selected while parking brake engaged
F or R flashin	Direction F or R selected while turbine
EE flashing	No communication with display Checked wiring from TCU to display
△ E	Engine speed too low,  raise engine speed
▽ E	Engine speed too high,  Lower engine speed
△ T	Transmission oil temperature too low,  heat up transmission
▽ T	Transmission oil temperature too high,  cool down transmission
FN	Shift lever not in Neutral position
FP	Park brake not applied

## AUDIO / VISUAL INDICATORS



1. Right / Left Indicator
2. Trans Oil Temp
3. High Beam
4. Low Air Pressure 1
5. Low Air Pressure 2
6. Battery Low Charge
7. Engine Oil Pressure
8. Air Filter Choke
9. Hazard Light
10. Trans. Oil Pressure Low
11. Parking Brake

RELAYS & FUSES



**Relays**

- 1 Front Work Lamp
- 2 Head Lamp Relay
- 3 Ignition Relay
- 4 Indicator Flasher
- 5 Reverse Relay
- 6 Parking
- 7 Buzzer
- 8 Horn

**Fuses**

- 9 Hazard Light
- 10 Radio & Cab Light
- 11 Electronic Control Unit
- 12 Fan
- 13 Indicator Flasher
- 14 Parking Brake
- 15 Low Beam
- 16 Tail Light
- 17 Wiper / Horn
- 18 Electronic Control Unit
- 19 Buzzer and Instrument Panel
- 20 Foot Brake Light
- 21 Work Lamp
- 22 High Beam

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**ELECTRICAL SYSTEM**


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BATTERY	:	2 x 12 V 120 AH
ALTERNATOR	:	LUCAS—35 AMP, 24 Volts

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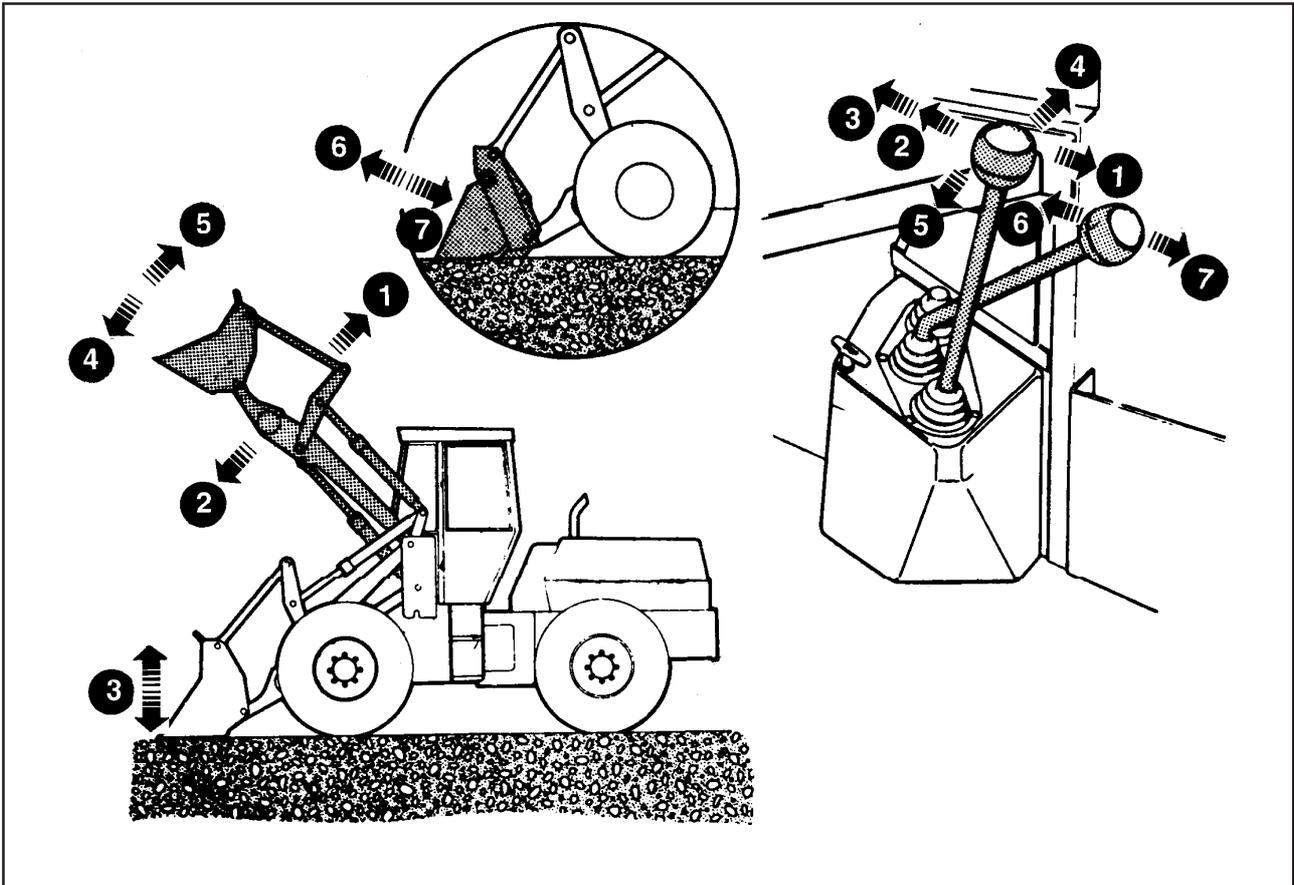
**LIGHT BULBS**

Instruments	9 x 2W
Interior Light	5W
Warning Light	11 x 2 W

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LIGHT BULBS	FRONT	REAR
Headlights Main	60W	—
Headlights Dip	55W	—
Working lights	55W	—

## HYDRAULIC CONTROLS



## Loader arms and bucket control lever

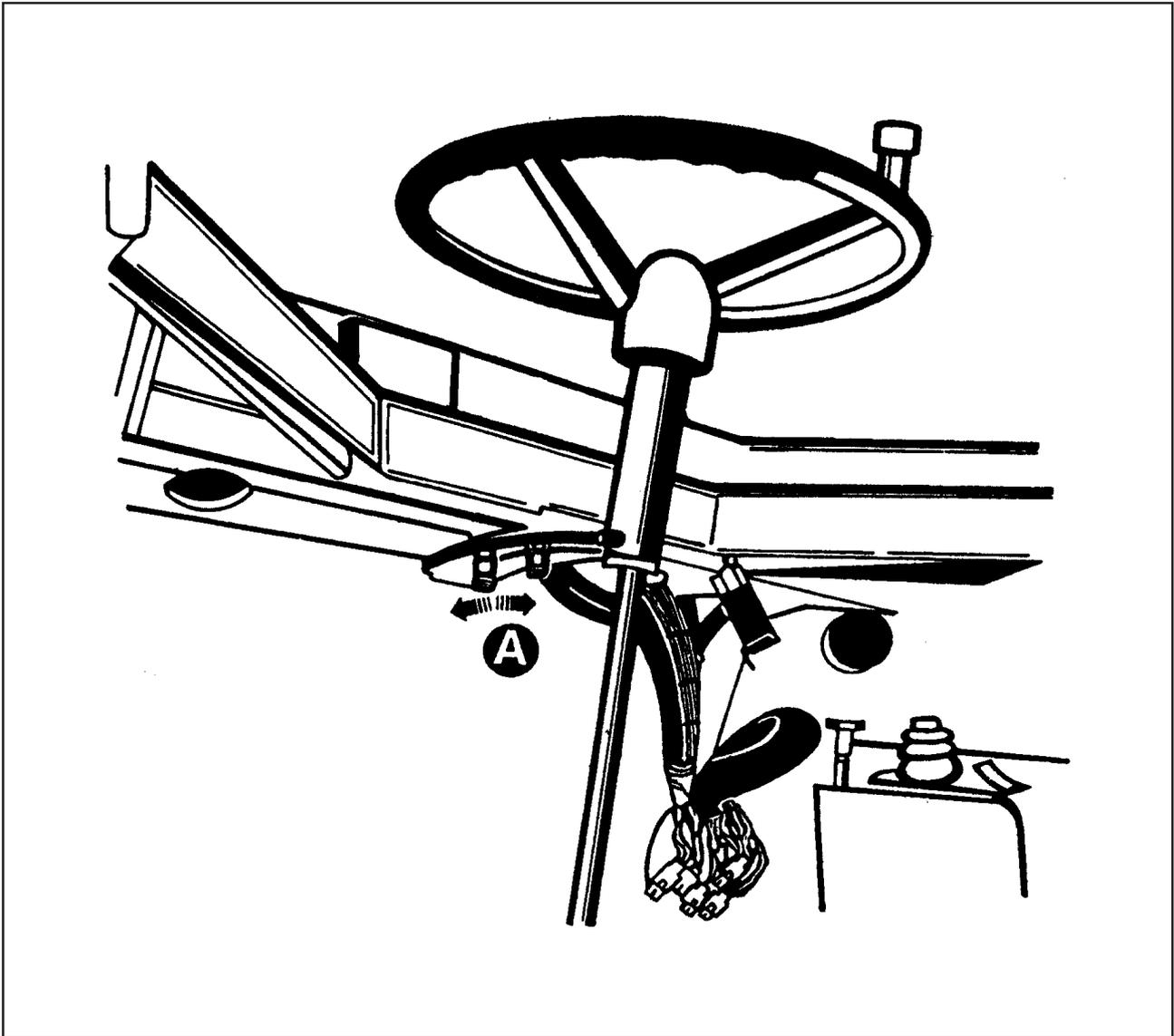
- 1 Arms raise
- 2 Arms lower
- 3 Arms float.
- 4 Bucket dump
- 5 Bucket roll back

**Optional :**

Auxiliary control bucket lever for six-in-one bucket

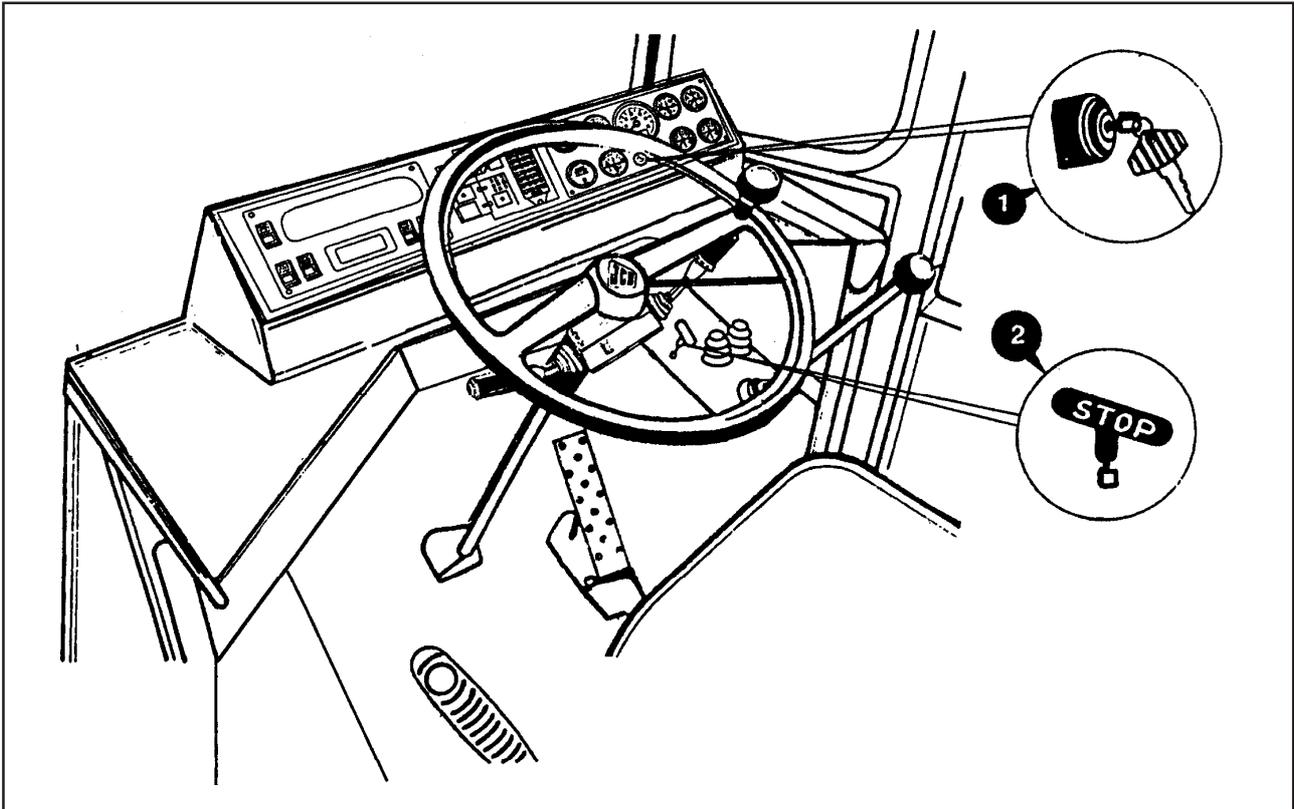
- 6 Bucket Open
- 7 Bucket Closed

## STEERING COLUMN



## ADJUSTMENT

- 1 Adjust steering column position A, Re-tighten lever to prevent column from moving.

**STARTING / STOPPING ENGINE****1. STARTING**

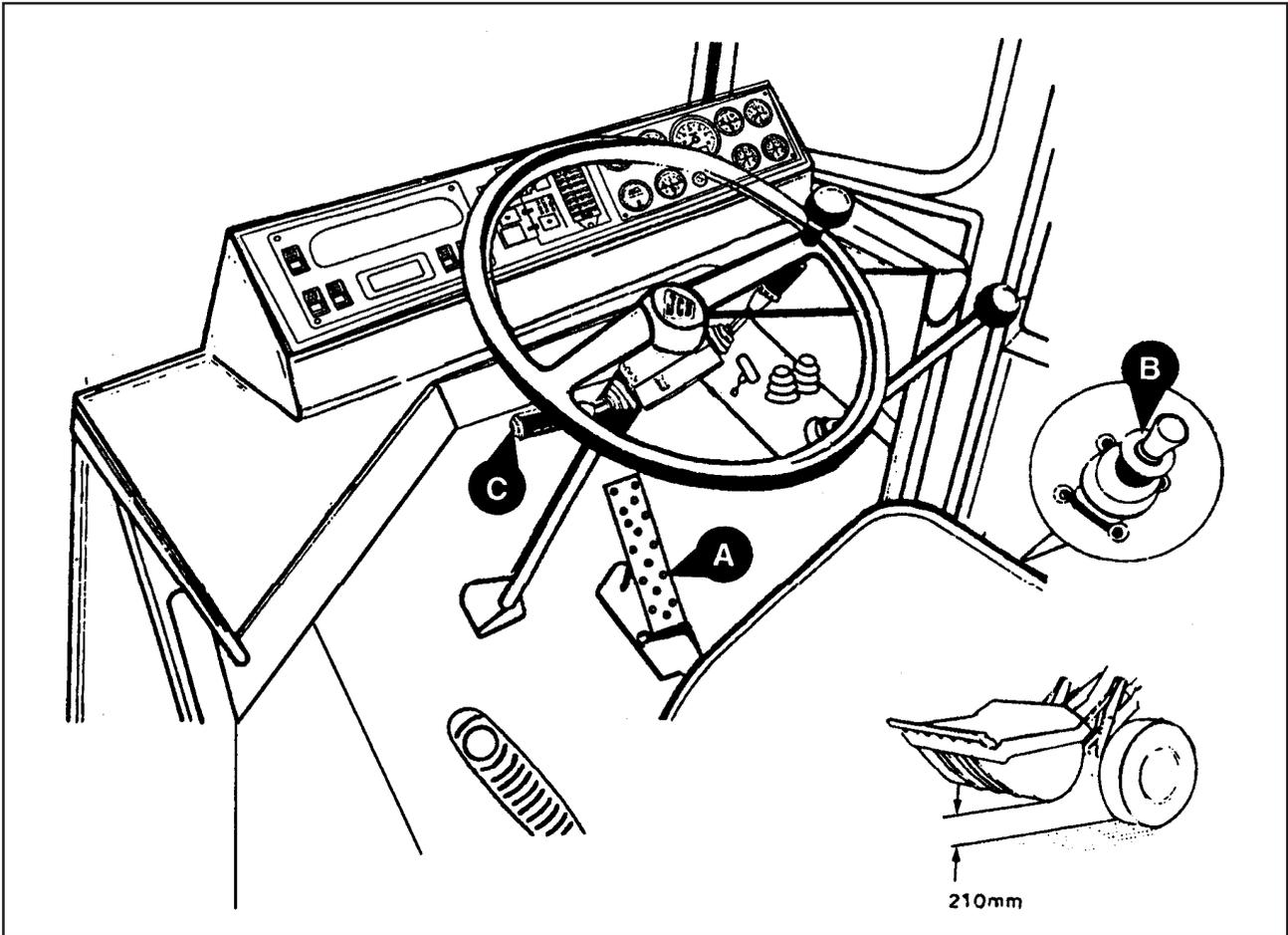
- a Ensure gear lever is in neutral.
- b Ensure parking brake is on.
- c Slightly depress accelerator pedal and turn starter key fully clockwise to start engine. Release key as soon as engine fires. .

**Note :** Audible alarm, engine oil pressure and No Charge Warning lights should go out once engine is started.

**2. STOPPING**

- a Ensure machine is in correct parking position.
- b Apply parking brake and select neutral.
- c Before stopping engine (Turbo-charged engines only) run at idling speed for 60 seconds, then pullout engine stop fully.
- d When engine stops return starter key to the off position.

## MOVING OFF



- 1 Ensure forward / everse lever 'C' is in neutral position.
- 2 Start engine. Ensure bucket is in travelling position.
- 3 Select parking brake 'B'
- 4 **Select accelerator pedal 'A' and accelerate engine till the air pressure gauge indicates 7 bar and the audio/visual warning for low pressure disappears.**
- 5 Select gear and forward or reverse 'C'. Accelerate engine. release parking brake 'B' and move off.

### TRAVELLING ON PUBLIC ROAD

Raise loader arm 210mm above road surface with bucket fully rolled back.