



Service Manual

ROBOT 150, 165

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| | |
|-----------------------------|----------|
| General Information | 1 |
| <hr/> | |
| Care & Safety | 2 |
| <hr/> | |
| Routine Maintenance | 3 |
| <hr/> | |
| Attachments | A |
| <hr/> | |
| Body & Framework | B |
| <hr/> | |
| Electrics | C |
| <hr/> | |
| Controls | D |
| <hr/> | |
| Hydraulics | E |
| <hr/> | |
| Transmission | F |
| <hr/> | |
| Brakes | G |
| <hr/> | |
| Engine | K |
| <hr/> | |

Introduction

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

These personnel should have a sound knowledge of workshop practice, safety procedures, and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment.

Renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course. It is expected that components will be cleaned and lubricated where appropriate, and that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid and ingress of dirt. Finally, please remember above all else **SAFETY MUST COME FIRST!**

The manual is compiled in sections, the first three are numbered and contain information as follows:

| | | |
|----------|---|--|
| 1 | = | General Information - includes torque settings and service tools. |
| 2 | = | Care & Safety - includes warnings and cautions pertinent to aspects of workshop procedures etc. |
| 3 | = | Routine Maintenance - includes service schedules and recommended lubricants for all the machine. |

The remaining sections are alphabetically coded and deal with Dismantling, Overhaul etc. of specific components, for example:

| | | |
|----------|---|-------------------------------------|
| A | = | Attachments |
| B | = | Body & Framework ...etc. |

The page numbering in each alphabetically coded section is not continuous. This allows for the insertion of new items in later issues of the manual.

Section contents, technical data, circuit descriptions, operation descriptions etc are inserted at the beginning of each alphabetically coded section.

All sections are listed on the front cover; tabbed divider cards align directly with individual sections on the front cover for rapid reference.

Where a torque setting is given as a single figure it may be varied by plus or minus 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third.

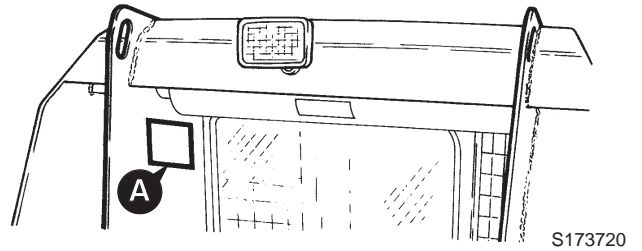
With the exception of slewing operations 'Left Hand' and 'Right Hand' are as viewed from the rear of the machine facing forwards.

| Contents | Page No. |
|---------------------------------|-----------------|
| Identifying your Machine | 1 - 1 |
| Torque Settings | 2 - 1 |
| Service Tools | |
| - Numerical List | 3 - 1 |
| - Electrics | 4 - 1 |
| - Hydraulics | 4 - 2 |
| Sealing and Retaining Compounds | 5 - 1 |

The serial number of the chassis, engine, lift arm and hydraulic pump unit positively identify the type of JCB Skid Steer Loader you have.

Machine Identification Plate

The machine identification plate **A** is located as shown. It is stamped with the serial numbers of the major individual units.



Typical Vehicle Identification Number (VIN)

SLP 165 S B V E 677001
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① World Manufacturer Identification
- ② Machine Model
- ③ Machine Type (S = Standard, H = High-flow)
- ④ Build Type (A = Canopy, B = Cab)
- ⑤ Year of Manufacture:
 T = 1996 1 = 2001
 V = 1997 2 = 2002
 W = 1998 3 = 2003
 X = 1999 4 = 2004
 Y = 2000 5 = 2005
- ⑥ Manufacturer Location (E = England)
- ⑦ Product Identification Number (PIN)

J.C. BAMFORD EXCAVATORS LTD.
 ROCESTER, STAFFS, ENGLAND.

CONSTRUCTOR MADE IN UK

Vehicle Identification No. Product Identification No.

ENGINE SERIAL No. WEIGHT

PUMP SERIAL No. YEAR OF MANUFACTURE

| MODEL | 80/1269/EEC | | MODEL | 80/1269/EEC | |
|--------|-------------|--------|--------|-------------|--------|
| | POWER KW | R.P.M. | | POWER KW | R.P.M. |
| 150 | 35 | 2800 | 1CX | 35 | 2800 |
| 165 | 35 | 2800 | 1CX HF | 35 | 2800 |
| 165 HF | 35 | 2800 | 185 | 52 | 2200 |
| | | | 185 HF | 52 | 2200 |

817/04437

Unit Identification

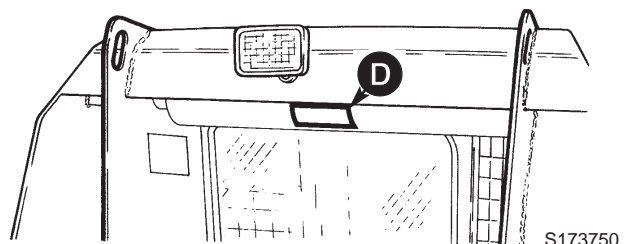
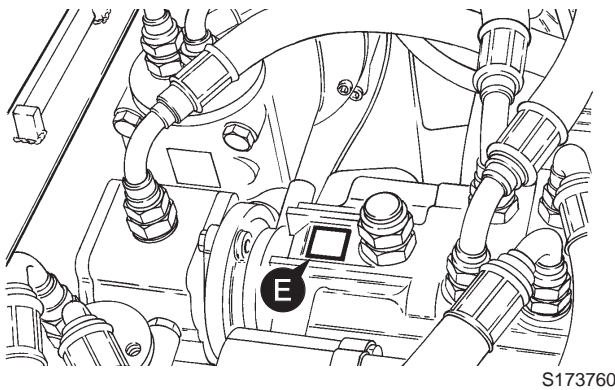
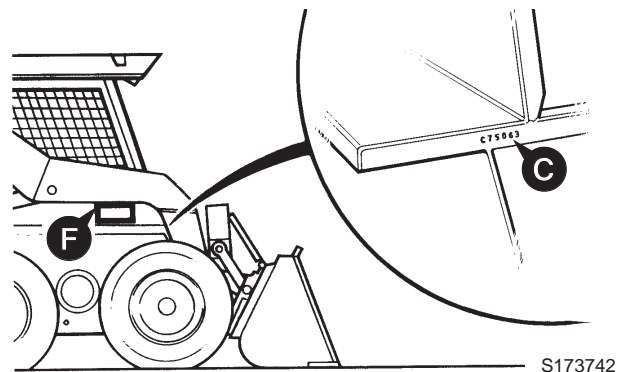
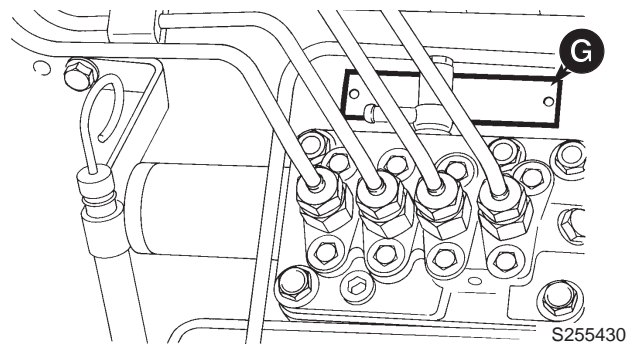
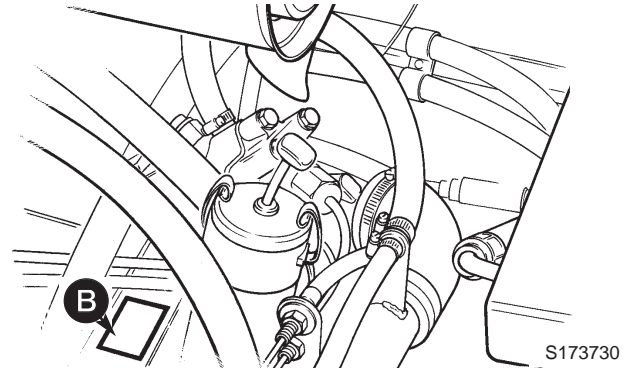
* The engine serial number on XUD engines is stamped on a machined area **B** on the top of the cylinder block. On JCB Diesel engines the number is stamped on a label **G** on the left side of the cylinder block.

The chassis serial number is stamped on the front edge of the right hand mudguard as shown at **C**. On early machines the serial number is stamped on the right hand side of the machine as shown at **F**.

The lift arm serial number is stamped on the rear of the lift arm as shown at **D**.

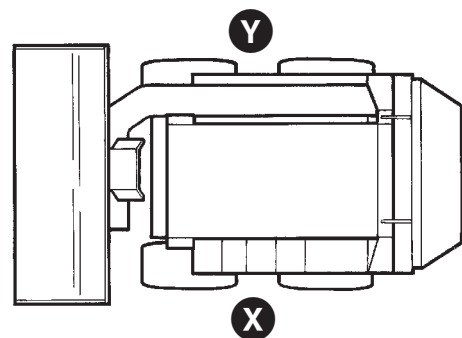
The hydraulic pump unit serial number is stamped on a plate on the top of the pump at **E**.

If any of the above units are replaced with new ones, the relevant serial number on the Machine Identification Plate will be superseded. Either stamp the plate with the new number or stamp out the old number.



Left Side, Right Side

In this manual, 'left' **X** and 'right' **Y** mean your left and right when you are seated correctly in the machine.



Use only where no torque setting is specified in the text. Values are for dry threads and may be within three per cent of the figures stated. For lubricated threads the values should be REDUCED by one third.

UNF Grade 'S' Bolts

| Bolt Size in | (mm) | Hexagon (A/F) in | Torque Settings | | |
|-----------------|--------|---------------------|-----------------|-------|--------|
| | | | Nm | kgf m | lbf ft |
| 1/4 | (6.3) | 7/16 | 14 | 1.4 | 10 |
| * 5/16 | (7.9) | 1/2 | 28 | 2.8 | 20 |
| 3/8 | (9.5) | 9/16 | 49 | 5.0 | 36 |
| 7/16 | (11.1) | 5/8 | 78 | 8.0 | 58 |
| 1/2 | (12.7) | 3/4 | 117 | 12.0 | 87 |
| 9/16 | (14.3) | 13/16 | 170 | 17.3 | 125 |
| 5/8 | (15.9) | 15/16 | 238 | 24.3 | 175 |
| 3/4 | (19.0) | 1 1/8 | 407 | 41.5 | 300 |
| 7/8 | (22.2) | 1 5/16 | 650 | 66.3 | 480 |
| 1 | (25.4) | 1 1/2 | 970 | 99.0 | 715 |
| 1 1/4 | (31.7) | 1 7/8 | 1940 | 198.0 | 1430 |
| 1 1/2 | (38.1) | 2 1/4 | 3390 | 345.0 | 2500 |

Metric Grade 8.8 Bolts

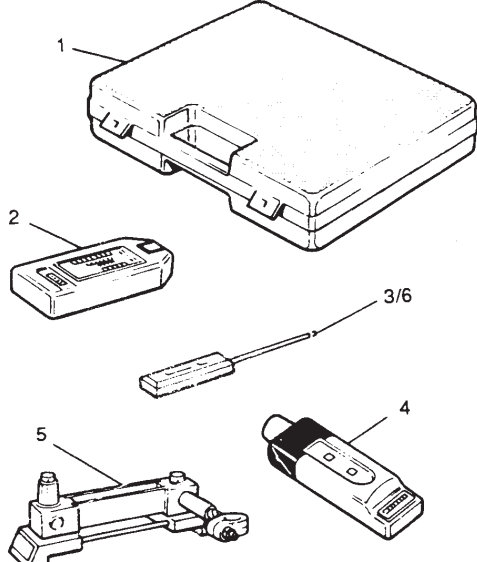
| Bolt Size in | (mm) | Hexagon (A/F) in | Torque Settings | | |
|-----------------|------|---------------------|-----------------|-------|--------|
| | | | Nm | kgf m | lbf ft |
| M5 | (5) | 8 | 7 | 0.7 | 5 |
| M6 | (6) | 10 | 12 | 1.2 | 9 |
| M8 | (8) | 13 | 28 | 3.0 | 21 |
| M10 | (10) | 17 | 56 | 5.7 | 42 |
| M12 | (12) | 19 | 98 | 10 | 72 |
| M16 | (16) | 24 | 244 | 25 | 180 |
| M20 | (20) | 30 | 476 | 48 | 352 |
| M24 | (24) | 36 | 822 | 84 | 607 |
| M30 | (30) | 46 | 1633 | 166 | 1205 |
| M36 | (36) | 55 | 2854 | 291 | 2105 |

Note: All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.

Numerical List

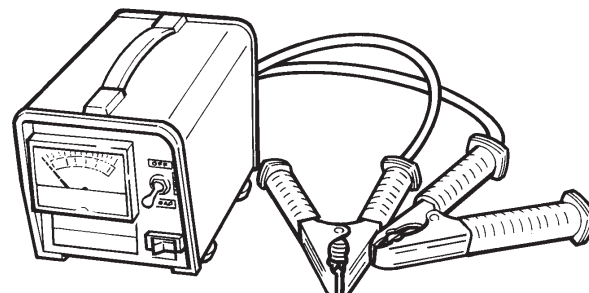
| | Page No. | | Page No. |
|---|-------------|--|----------|
| 1406/0011 Bonded Washer | 4 - 3 | 892/00268 Flow Monitoring Unit | 4 - 2 |
| 1406/0018 Bonded Washer | 4 - 3 | 892/00269 Sensor Head | 4 - 2 |
| 1406/0021 Bonded Washer | 4 - 2/4 - 3 | 892/00270 Load Valve | 4 - 2 |
| 1406/0029 Bonded Washer | 4 - 3 | 892/00271 Adapter | 4 - 2 |
| 1604/0003 Adapter | 4 - 3 | 892/00272 Adapter | 4 - 2 |
| 1604/0004 Adapter | 4 - 3 | 892/00274 Adapter | 4 - 3 |
| 1604/0006 Adapter | 4 - 2/4 - 3 | 892/00275 Adapter | 4 - 2 |
| 1606/0003 Adapter | 4 - 3 | 892/00276 Adapter | 4 - 2 |
| 1606/0004 Adapter | 4 - 3 | 892/00277 Adapter | 4 - 2 |
| 1606/0007 Adapter | 4 - 3 | 892/00278 Gauge | 4 - 3 |
| 1606/0008 Adapter | 4 - 3 | 892/00279 Gauge | 4 - 3 |
| 1606/0009 Adapter | 4 - 3 | 892/00281 AVO Meter | 4 - 1 |
| 1612/0006 Adapter | 4 - 2 | 892/00282 Shunt | 4 - 1 |
| * 4101/0251 Threadlocker and Sealer | 5 - 1 | 892/00283 Tool Kit Case | 4 - 1 |
| * 4101/0451 Threadlocker | 5 - 1 | 892/00284 Tachometer | 4 - 1 |
| * 4101/0552 Threadlocker and Sealer (High Strength) | 5 - 1 | 892/00285 Hydraulic Oil Temperature Probe | 4 - 1 |
| * 4101/0651 Retainer (High Strength) | 5 - 1 | 892/00286 Surface Temperature Probe | 4 - 1 |
| * 4102/0551 High Strength Threadlocker | 5 - 1 | 892/00706 Test Probe | 4 - 3 |
| 4102/1201 Multi-Gasket | 5 - 1 | 892/00858 Pump Support Bracket | 4 - 3 |
| * 4104/0251 Activator (Aerosol) | 5 - 1 | 892/00923 A.R.V Test Block - Commercial Hyd. | 4 - 3 |
| * 4104/0253 Activator (Bottle) | 5 - 1 | 992/09300 Spanner | 4 - 3 |
| * 4104/1557 JCB Cleaner/Degreaser | 5 - 1 | 992/09400 Spanner | 4 - 3 |
| 816/00189 Blanking Cap | 4 - 4 | 992/09500 Spanner | 4 - 3 |
| 816/00190 Blanking Cap | 4 - 4 | 992/09600 Spanner | 4 - 3 |
| 816/00193 Blanking Cap | 4 - 4 | 993/68100 Slide Hammer | 4 - 4 |
| 816/00196 Blanking Cap | 4 - 4 | 993/85700 Battery Tester | 4 - 1 |
| 816/00197 Blanking Cap | 4 - 4 | 993/99510 Half Moon Spanner | 4 - 4 |
| 816/00294 Blanking Cap | 4 - 4 | | |
| 816/15118 Pressure Test Adapter | 4 - 2 | The following parts are replacement items for kits and would normally be included in the kit numbers quoted above. | |
| 816/20008 Adapter | 4 - 2 | | |
| 816/50043 'T' Adapter | 4 - 4 | Replacement items for kit no. 892/00253 | |
| 816/55038 Pressure Test 'T' Adapter | 4 - 2 | 892/00201 Replacement Gauge | 4 - 2 |
| 816/55040 Pressure Test 'T' Adapter | 4 - 2 | 892/00202 Replacement Gauge | 4 - 2 |
| 816/60096 'T' Adapter | 4 - 4 | 892/00203 Replacement Gauge | 4 - 2 |
| 892/00047 'T' Adapter | 4 - 4 | 892/00254 Replacement Hose | 4 - 2 |
| 892/00048 'T' Adapter | 4 - 4 | | |
| 892/00055 Blanking Plug | 4 - 4 | | |
| 892/00056 Blanking Plug | 4 - 4 | | |
| 892/00057 Blanking Plug | 4 - 4 | | |
| 892/00059 Blanking Plug | 4 - 4 | | |
| 892/00060 Blanking Plug | 4 - 4 | | |
| 892/00074 Female Connector | 4 - 4 | | |
| 892/00075 Female Connector | 4 - 4 | | |
| 892/00077 Female Connector | 4 - 4 | | |
| 892/00137 Hose | 4 - 3 | | |
| 892/00223 Hand Pump | 4 - 3 | | |
| 892/00252 A.R.V Test Block - Husco | 4 - 3 | | |
| 892/00253 Pressure Test Kit | 4 - 2 | | |
| 892/00255 Pressure Test Adapter | 4 - 2 | | |
| 892/00256 Pressure Test Adapter | 4 - 2 | | |
| 892/00257 Pressure Test Adapter | 4 - 2 | | |
| 892/00258 Pressure Test Adapter | 4 - 2 | | |
| 892/00259 Pressure Test Adapter | 4 - 2 | | |
| 892/00260 Pressure Test Adapter | 4 - 2 | | |
| 892/00261 Pressure Test Adapter | 4 - 2 | | |
| 892/00262 Pressure Test 'T' Adapter | 4 - 2/4 - 3 | | |
| 892/00263 Pressure Test 'T' Adapter | 4 - 2 | | |
| 892/00264 Pressure Test 'T' Adapter | 4 - 2 | | |
| 892/00265 Pressure Test 'T' Adapter | 4 - 2 | | |

Section C - Electrics



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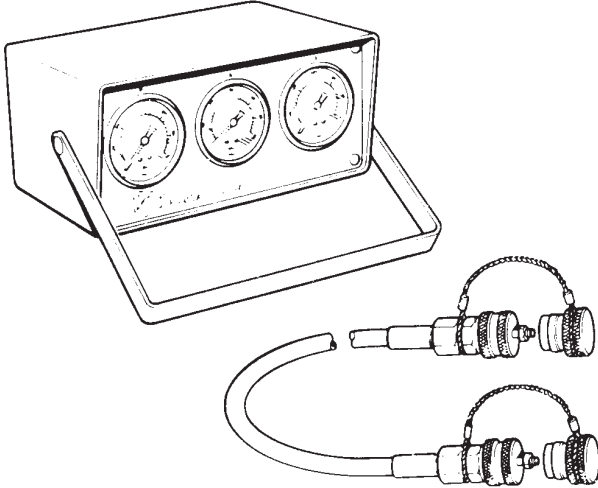
| AVO Test Kit | | |
|--------------|-----------|---------------------------------|
| 1 | 892/00283 | Tool Kit Case |
| 2 | 892/00281 | AVO Meter |
| 3 | 892/00286 | Surface Temperature Probe |
| 4 | 892/00284 | Microtach Digital Tachometer |
| 5 | 892/00282 | Shunt - open type |
| 6 | 892/00285 | Hydraulic Oil Temperature Probe |



239510

* 993/85700 Battery Tester

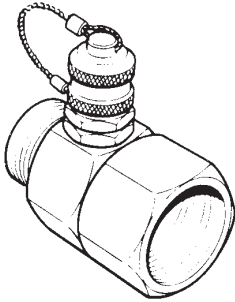
Section E - Hydraulics



Hydraulic Circuit Pressure Test Kit

- 892/00253 Pressure Test Kit
- 892/00201 Replacement Gauge 0-20 bar (0-300 lbf/in²)
- 892/00202 Replacement Gauge 0-40 bar (0-600 lbf/in²)
- * 892/00203 Replacement Gauge 0-400 bar (0-6000 lbf/in²)
- 892/00254 Replacement Hose

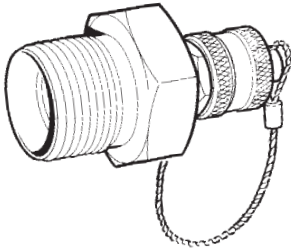
188120



Pressure Test 'T' Adapters

- 892/00262 1/4 in M BSP x 1/4 in F BSP x Test Point
- 816/55038 3/8 in M BSP x 3/8 in F BSP x Test Point
- 816/55040 1/2 in M BSP x 1/2 in F BSP x Test Point
- 892/00263 5/8 in M BSP x 5/8 in F BSP x Test Point
- 892/00264 3/4 in M BSP x 3/4 in F BSP x Test Point
- 892/00265 1 in M BSP x 1 in F BSPP x Test Point

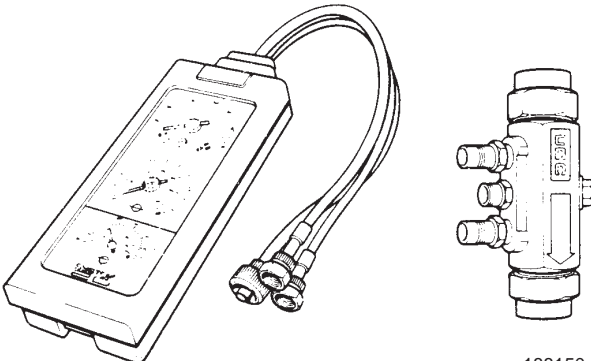
188130



Pressure Test Adapters

- 892/00255 1/4 in BSP x Test Point
- 892/00256 3/8 in BSP x Test Point
- 892/00257 1/2 in BSP x Test Point
- 892/00258 5/8 in BSP x Test Point
- 816/15118 3/4 in BSP x Test Point
- 892/00259 1 in BSP x Test Point
- 892/00260 1.1/4 in BSP x Test Point
- 892/00261 5/8 in UNF x Test Point

200140



Flow Test Equipment

- 892/00268 Flow Monitoring Unit
- 892/00269 Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
- 892/00270 Load Valve
- 1406/0021 Bonded Washer
- 1604/0006 Adapter 3/4 in M x 3/4 in M BSP
- 1612/0006 Adapter 3/4 in F x 3/4 in M BSP
- 892/00271 Adapter 3/4 in F x 5/8 in M BSP
- 892/00272 Adapter 5/8 in F x 3/4 in M BSP
- 816/20008 Adapter 3/4 in F x 1/2 in M BSP
- 892/00275 Adapter 1/2 in F x 3/4 in M BSP
- 892/00276 Adapter 3/4 in F x 3/8 in M BSP
- 892/00277 Adapter 3/8 in F x 3/4 in M BSP

188150

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manual instantly.**

No waiting.

Maintenance Safety (cont'd)**⚠ 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.

INT-3-2-3

⚠ WARNING**Soft Ground**

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

INT-3-2-4

⚠ WARNING**Tyres and Rims**

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

INT-3-2-6

⚠ 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.

INT-3-2-7/1

⚠ WARNING**Hot Coolant**

The cooling system is pressurised 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 steam pressure escape, then remove the cap.

INT-3-2-9

⚠ 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.

INT-3-2-10

⚠ CAUTION**Cleaning**

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

INT-3-2-11

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

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

INT-3-2-12

⚠ 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.

INT-3-3-2

⚠ 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.

GEN-6-2

Safety Decals

WARNING

Decals on the machine warn you of particular hazards. Each decal is attached close to a part of the machine where there is a possible hazard. Read and make sure you understand the safety message before you work with or on that part of the machine.

Keep all decals clean and readable. Replace lost or damaged decals. The decals and their attachment points are shown on the following pages. Each decal has a part number printed on it, use this number to order a new decal from your JCB distributor.

INT-3-3-3

WARNING

If you need eye-glasses for reading, make sure you wear them when reading the safety decals. Decals are strategically placed around the machine to remind you of possible hazards. Do not over-stretch or place yourself in dangerous positions to read the decals.

INT-3-3-4