



# Service Manual

## ROBOT 185, 1105

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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 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:

- |          |   |  |
|----------|---|--|
| <b>1</b> | = | <b>General Information</b> - includes torque settings and service tools.                                   |
| <b>2</b> | = | <b>Care &amp; Safety</b> - includes warnings and cautions pertinent to aspects of workshop procedures etc. |
| <b>3</b> | = | <b>Routine Maintenance</b> - 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:

- |          |   |                                     |
|----------|---|-------------------------------------|
| <b>A</b> | = | <b>Attachments</b>                  |
| <b>B</b> | = | <b>Body &amp; Framework</b> ...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.

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



## 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 device (servo).



**Green:** Exhaust

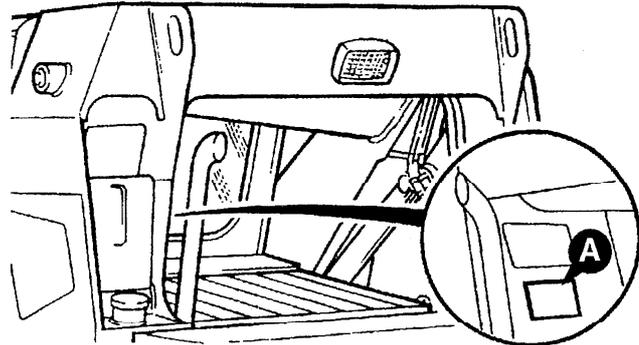


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The serial number of the chassis, engine, lift arm and hydraulic pump unit positively identify the type of JCB Skid Steer Loader you have.

**Machine Identification Plate**

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



S222930

**Typical Vehicle Identification Number (VIN)**

SLP 185 S B V E 746001  
 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)

CE		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.

817/04437

290010

### Unit Identification

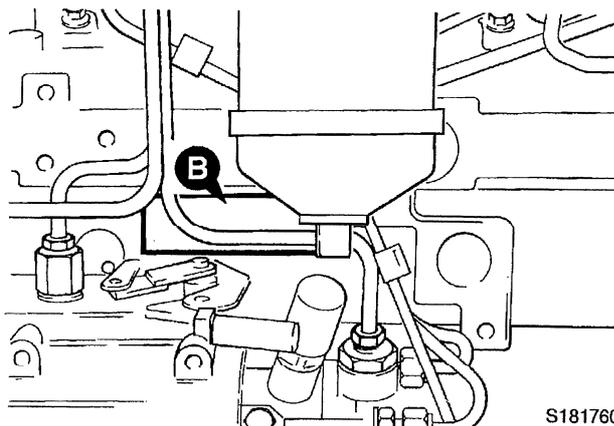
The engine serial number is stamped on a label **B** on the side of the cylinder block.

The chassis serial number is stamped on the front face of the chassis underneath the windscreen as shown at **C**.

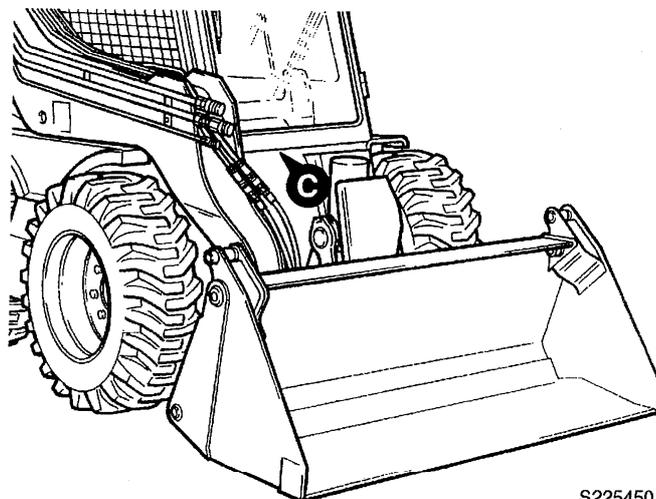
The lift arm serial number is stamped on the rear of the lift arm as shown at **D**.

The hydraulic pump unit serial number is stamped underneath the pump towards the drive end.

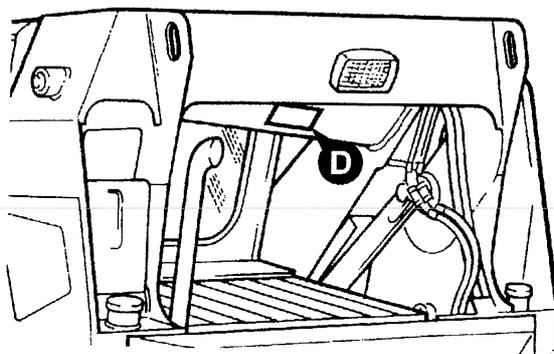
If any of the above units are replaced with new ones, the relevant serial number on the Machine Identification Plate will be superseded. Either stamp the plate with the new number or stamp out the old number.



S181760



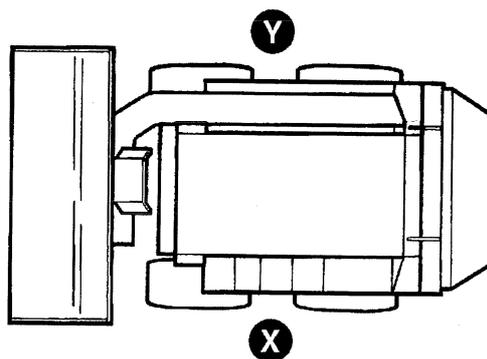
S225450



S224180

### 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.



173660

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

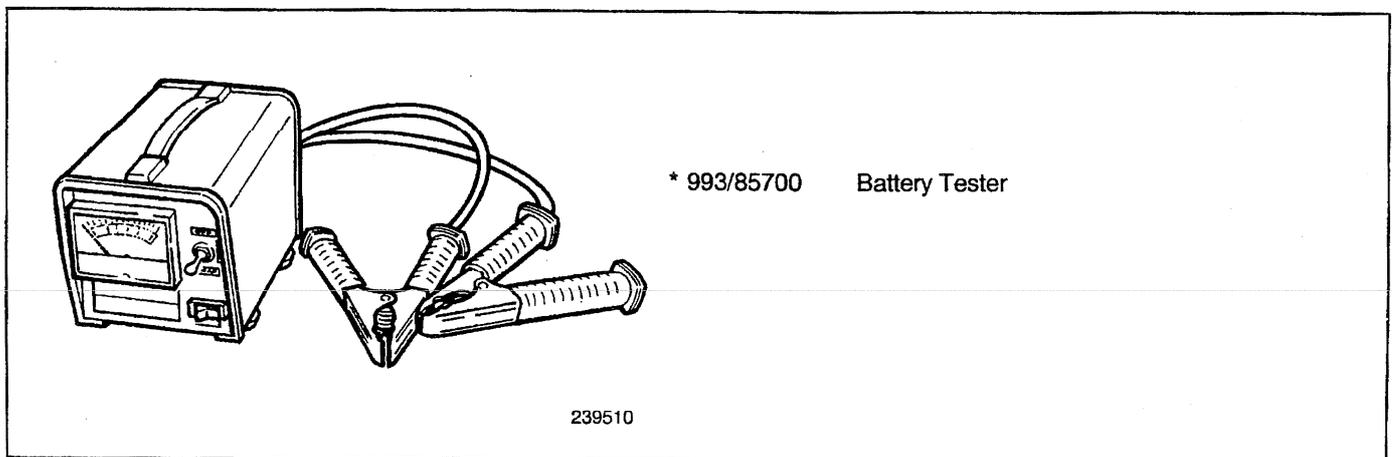
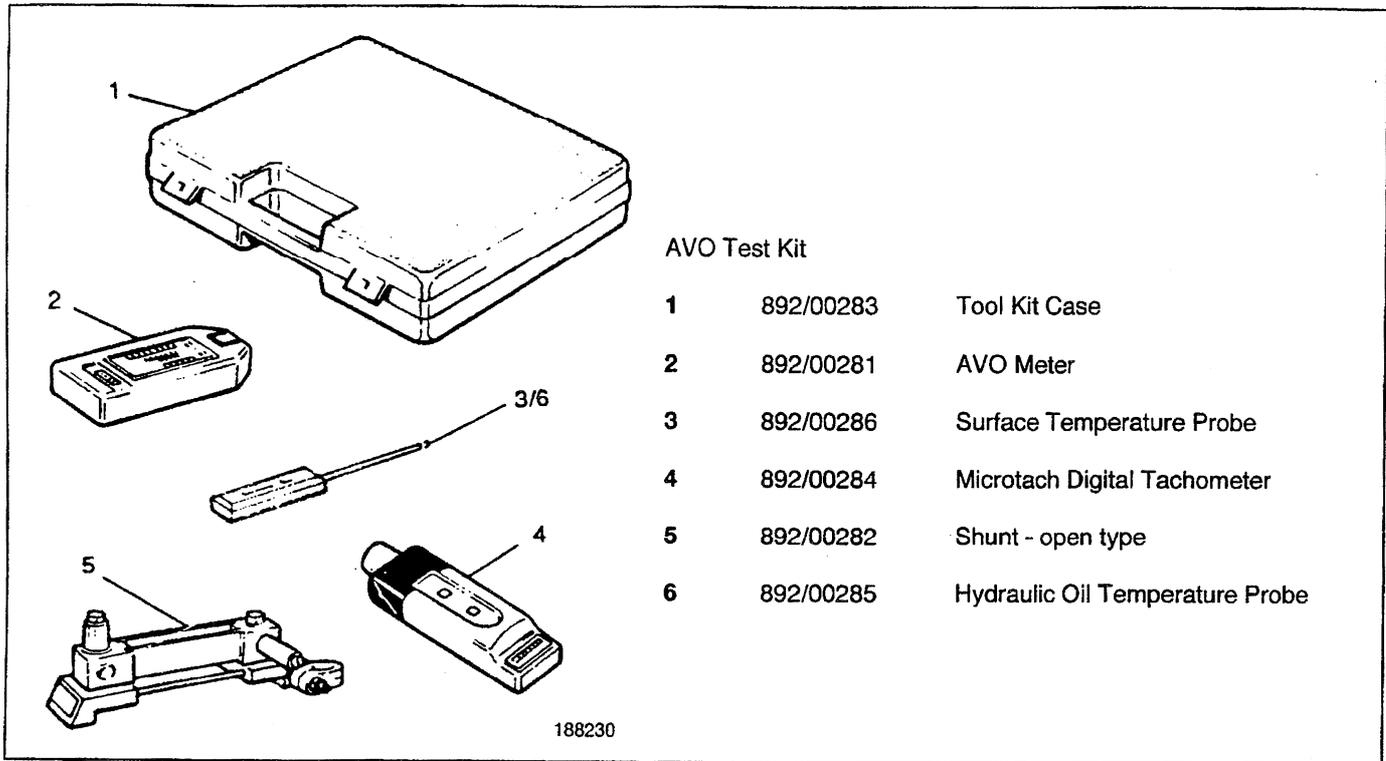
**Metric Grade 8.8 Bolts**

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

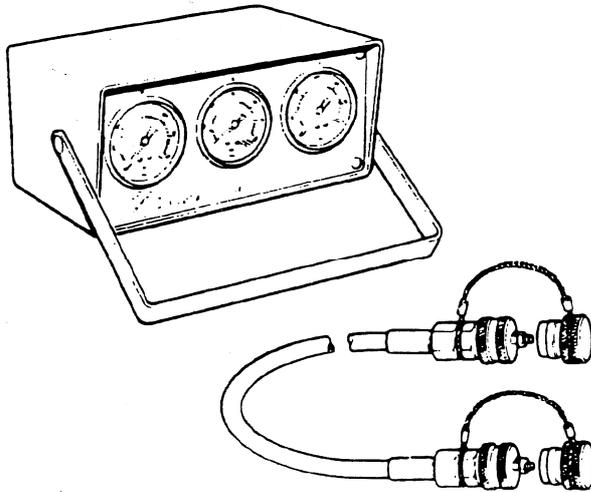
**Note:** All bolts used on JCB machines are high tensile and must not be replaced by bolts of a lesser tensile specification.



Section C - Electrics



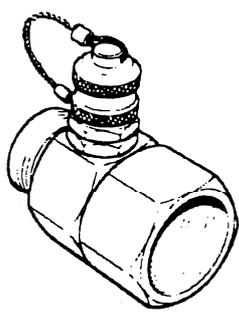
Section E - Hydraulics



**Hydraulic Circuit Pressure Test Kit**

- 892/00253 Pressure Test Kit
- 892/00201 Replacement Gauge 0-20 bar (0-300 lbf/in<sup>2</sup>)
- 892/00202 Replacement Gauge 0-40 bar (0-600 lbf/in<sup>2</sup>)
- 892/00203 Replacement Gauge 0-400 bar (0-6000 lbf/in<sup>2</sup>)
- 892/00254 Replacement Hose

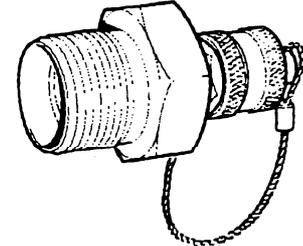
188120



**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

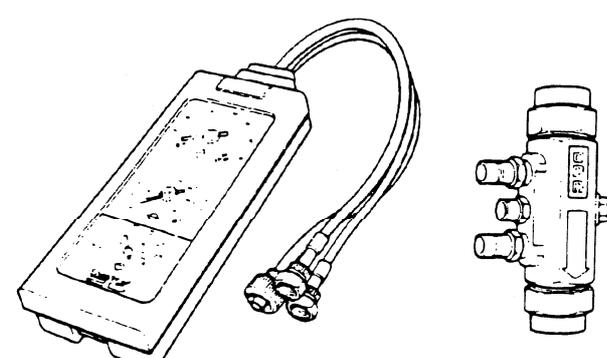
188130



**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

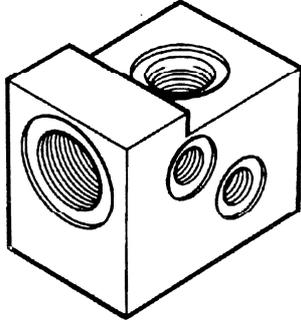


**Flow Test Equipment**

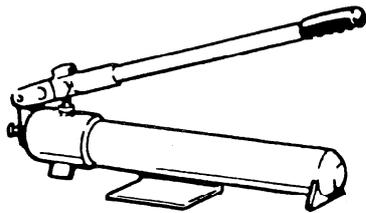
- 892/00268 Flow Monitoring Unit
- 892/00269 Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
- 892/00270 Load Valve
- 1406/0021 Bonded Washer
- 1604/0006 Adapter 3/4 in M x 3/4 in M BSP
- 1612/0006 Adapter 3/4 in F x 3/4 in M BSP
- 892/00271 Adapter 3/4 in F x 5/8 in M BSP
- 892/00272 Adapter 5/8 in F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

Section E - Hydraulics



\* 892/00252 Test Block for A. R. V.



193850

Hand Pump Equipment

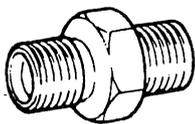
- 892/00223 Hand Pump
- 892/00137 Micro-bore Hose 1/4 in BSP x 5 metres
- 892/00274 Adapter 1/4 in M BSP x 3/8 in M BSP Taper
- 892/00262 1/4 in M BSP x 1/4 in F BSP x Test Point
- 892/00706 Test Probe
- 892/00278 Gauge 0 - 40 bar (0 - 600 lbf/in<sup>2</sup>)
- 892/00279 Gauge 0 - 400 bar (0 - 6000 lbf/in<sup>2</sup>)



188140

Bonded Washers

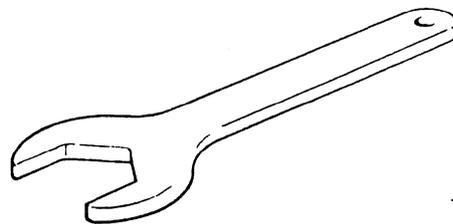
- 1406/0011 1/4 in BSP
- 1406/0018 1/2 in BSP
- 1406/0021 3/4 in BSP
- 1406/0029 1.1/4 in BSP



193860

Male Adapters - BSP x BSP

- 1606/0003 3/8 in x 1/4 in
- 1604/0003 3/8 in x 3/8 in
- 1606/0004 1/2 in x 1/4 in
- 1606/0007 1/2 in x 3/8 in
- 1604/0004 1/2 in x 1/2 in
- 1606/0008 3/4 in x 3/8 in
- 1606/0009 3/4 in x 1/2 in
- 1604/0006 3/4 in x 3/4 in

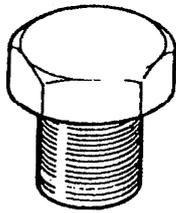


193930

Hexagon Spanners for Ram Pistons and End Caps

- 992/09300 55 mm A/F
- 992/09400 65 mm A/F
- 992/09500 75 mm A/F
- 992/09600 85 mm A/F

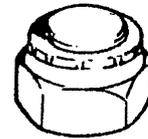
Section E - Hydraulics



193870

Female Cone Blanking Plug

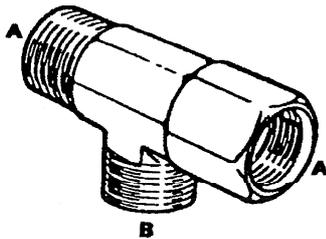
- 892/00055 1/4 in BSP
- 892/00056 3/8 in BSP
- 892/00057 1/2 in BSP
- 892/00059 3/4 in BSP
- 892/00060 1 in BSP'T'



193880

Male Cone Blanking Plug

- 816/00294 1/4 in BSP
- 816/00189 3/8 in BSP
- 816/00190 1/2 in BSP
- 816/00197 5/8 in BSP
- 816/00196 3/4 in BSP
- 816/00193 1 in BSP



193890

'T' Adapters

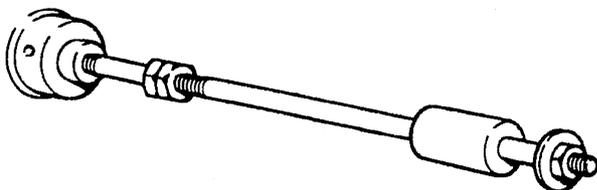
- 892/00047 3/8 in BSP (A) x 1/4 in BSP (B)
- 892/00048 1/2 in BSP (A) x 1/4 in BSP (B)
- 816/50043 3/4 in BSP (A) x 1/4 in BSP (B)
- 816/60096 3/4 in BSP (A) x 3/4 in BSP (B)



193900

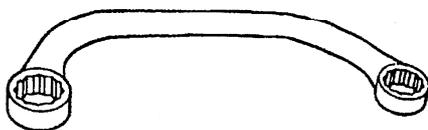
Female Connectors

- 892/00074 3/8 in BSP x 3/8 in BSP
- 892/00075 1/2 in BSP x 1/2 in BSP
- 892/00077 3/4 in BSP x 3/4 in BSP



193910

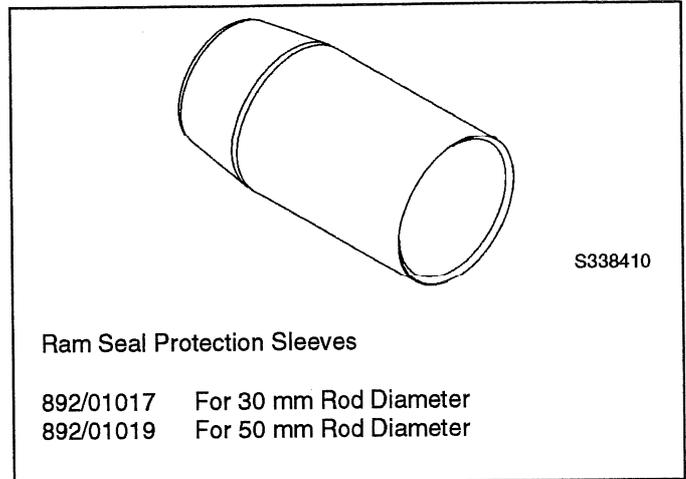
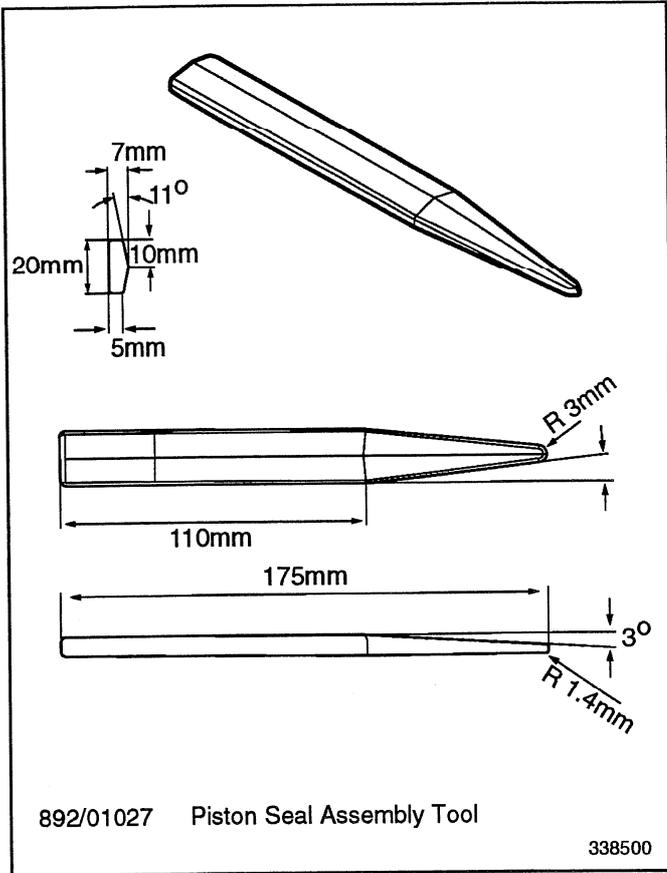
993/68100 Slide Hammer



193920

993/99510 Half Moon Spanner

Section E - Hydraulics



<b>JCB Multigasket</b>	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65 mm diameter.	4102/1212	50ml
<b>JCB Threadlocker</b>	A locking fluid for use on threads larger than 50 mm dia.	4101/0451	50ml
<b>JCB Threadlocker (High Strength)</b>	A high strength locking fluid for use with threaded components. Gasketing for all sizes of flange where the strength of the joint is important.	4102/0551	50ml
<b>JCB Retainer (High Strength)</b>	For retaining parts which are unlikely to be dismantled.	4101/0651	50ml
<b>JCB Threadlocker &amp; Sealer</b>	A medium strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm dia., and for hydraulic fittings up to 25 mm dia.	4101/0250 4101/0251	10ml 50ml
<b>JCB Threadlocker &amp; Sealer (High Strength)</b>	A medium to high strength locking fluid for retention and sealing of ram piston heads.	4101/0550 4101/0552	10ml 50ml
<b>JCB Threadseal</b>	A medium strength thread sealing compound.	4102/1951	50ml
<b>JCB Activator</b>	A cleaning primer which speeds the curing rate of anaerobic products.	4104/0251 4104/0253	Aerosol (1 ltr) Bottle (200 ml)
<b>JCB Cleaner/Degreaser</b>	For degreasing components prior to use of anaerobic adhesives and sealants.	4104/1557	Aerosol (400 ml)

The part numbers and descriptions of sealing and retaining compounds available from JCB Service have been revised with effect from January 1997 (see MI 563/H, 507/HA, 511/E). The list above has been changed accordingly.

References to these products on subsequent pages in this service manual will be progressively updated but for convenience a cross reference table is shown below.

Old Description	Old Part Number	New Description	New Part Number
<b>JCB High Strength Threadlocker</b>	4102/0502	<b>JCB Threadlocker (High Strength)</b>	4102/0551
<b>JCB High Strength Retainer</b>	4101/0602	<b>JCB Retainer (High Strength)</b>	4101/0651
<b>JCB Lock &amp; Seal</b>	4101/0202	<b>JCB Threadlocker &amp; Sealer</b>	4101/0251
<b>Loctite 243</b>	4101/1101	Use 4101/0251	
<b>Loctite 262</b>	4101/0502	<b>JCB Threadlocker &amp; Sealer (High Strength)</b>	4101/0552
<b>Loctite 932</b>	4101/0402	<b>JCB Threadlocker</b>	4101/0451
<b>Loctite Activator N</b>	4104/0101 Aerosol 4104/0102 Bottle	<b>JCB Activator</b>	4104/0251 4104/0253
<b>JCB Cleaner &amp; Degreaser</b>	4104/1538 Aerosol	<b>JCB Cleaner/Degreaser</b>	4104/1557



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## 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.

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

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**

GEN-1-6

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## 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.

INT-1-3-4

### 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.

INT-1-3-5

### 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.

INT-1-3-6

### 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.

INT-1-3-7

### WARNING

#### Raised Attachments

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

INT-1-3-8

## Operating Safety

### **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.

INT-2-1-3

### **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.

INT-2-1-4

### **WARNING**

#### Entering/Leaving

When entering and leaving the cab, use the step and handrails. Make sure the step, handrails and your boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls or Safety Restraint Bar as handholds, use only the handrails.

3-1-1-1

### **WARNING**

#### Engine

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

INT-2-1-6/1

### **WARNING**

#### ROPS/FOPS Structure

The machine is fitted with a Roll Over Protection Structure (ROPS) and a Falling Objects Protection Structure (FOPS). You could be killed or seriously injured if you operate the machine with a damaged or missing ROPS/FOPS. If the ROPS/FOPS has been in an accident, do not use the machine until the structure has been renewed. Modifications and repairs that are not approved by the manufacturer may be dangerous and will invalidate the ROPS/FOPS certification.

INT-2-1-9/3

### **WARNING**

#### Seat Belts

The ROPS/FOPS cab is designed to give you protection in an accident. If you do not wear your seat belt, you could be thrown around inside the cab or thrown out of the machine and crushed. You must wear a seat belt when using the machine. Fasten the seat belt before starting the engine.

2-2-1-9

### **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.

INT-2-1-10

### **WARNING**

#### Passengers

Passengers in or on the machine can cause accidents. The JCB Skid Steer Loader is a one man machine. Do not carry passengers.

INT-2-2-2

### **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.

INT-2-2-3

### **WARNING**

#### Ramps and Trailers

Water, mud, ice, grease and oil on ramp 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. Always reverse up a ramp if unloaded, travel forwards if loaded.

3-1-1-3/1

### **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.

INT-2-2-10

### **WARNING**

#### Attachments

Use only JCB approved attachments. Non-approved attachments, modified to fit the Skid Steer Loader, could cause damage to the machine, and/or make it unsafe. The use of non-approved attachments could invalidate your warranty.

3-1-2-1

## 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.

GEN-1-5

### **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.

INT-3-1-3

### **WARNING**

#### Electrical Circuits

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

INT3-1-4

### **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.

INT-3-1-5

### **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.

INT-3-1-6

### **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.

INT-3-1-7

### **CAUTION**

\* Do not switch the battery isolator OFF while the engine is running. Failure to comply may result in damage to the electrical circuits.

4-2-1-7

### **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.

INT-3-1-8

### **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.

INT-3-1-9

### **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.

INT-3-1-10/1

### **WARNING**

#### Hydraulic Pressure

It is not possible to vent all residual pressure. Loosen the connection one full turn and allow the pressure to dissipate. Keep face and hands well clear of pressurised hydraulic oil and wear protective glasses.

HYD 4-3

### **DANGER**

#### Electrolyte

Battery electrolyte is toxic and corrosive. Do not breathe the gases given off by the battery. Keep the electrolyte away from your clothes, skin, mouth and eyes. Wear safety glasses. See Battery in MAINTENANCE section for First Aid treatment.

INT-3-2-1/2

### **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 or injury if you do not follow these precautions.

INT-3-2-2

**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

**Maintenance Safety (cont'd)****⚠ 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.

INT-3-3-5/1

## 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

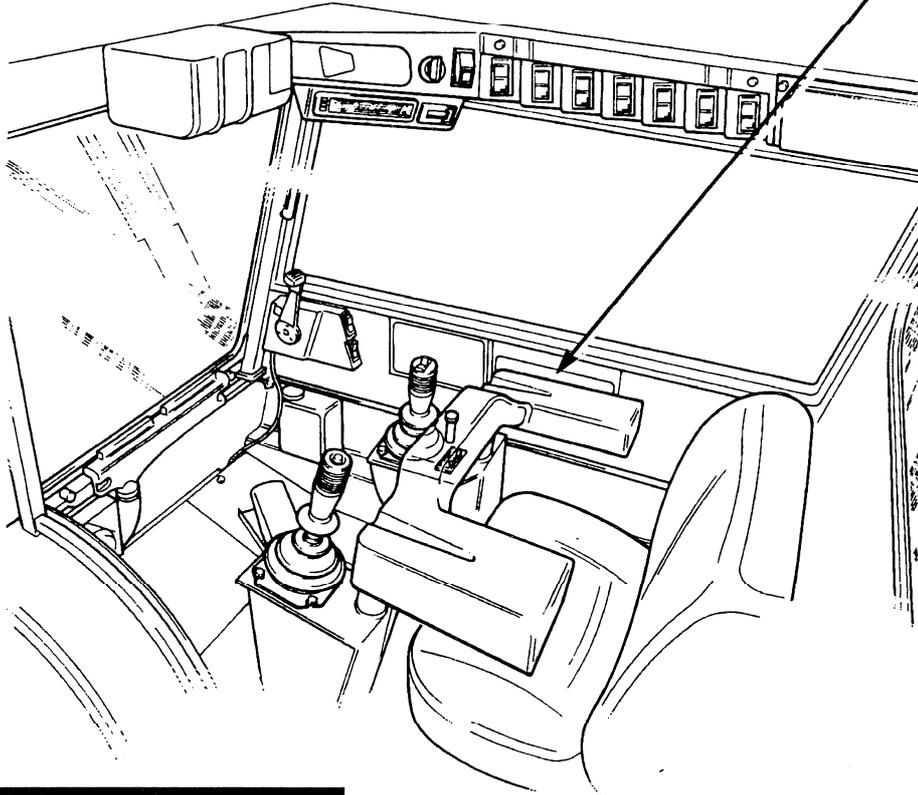
If you need eye-glasses for reading, make sure you wear them when reading the safety decals. Decals are strategically placed around the machine to remind you of possible hazards. Do not over-stretch or place yourself in dangerous positions to read the decals.

INT-3-3-4

Safety Decals (cont'd)

**⚠ DANGER**  
 DO NOT STAND UNDER LOADER  
 ARM OR EXIT THROUGH THE  
 FRONT OF THE MACHINE EXCEPT  
 IN AN EMERGENCY.

817/03149

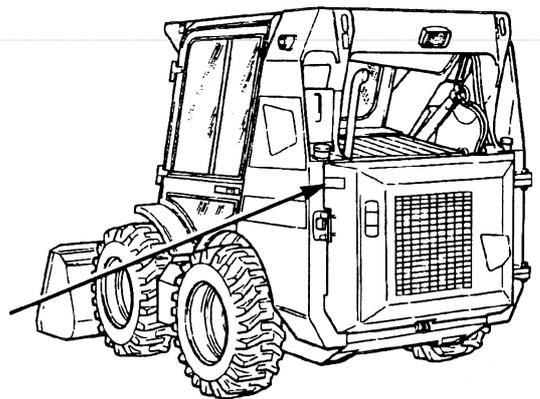


**⚠ WARNING**  
 DO NOT OPERATE OR WORK ON THIS MACHINE  
 UNLESS YOU HAVE READ AND UNDERSTAND THE  
 INSTRUCTIONS AND WARNINGS IN THE OPERATION  
 AND MAINTENANCE MANUAL. FAILURE TO FOLLOW  
 THE INSTRUCTIONS OR HEED THE WARNINGS  
 COULD RESULT IN INJURY OR DEATH.  
 CONTACT ANY J.C.B. DEALER FOR REPLACEMENT  
 COPIES. PROPER CARE IS YOUR RESPONSIBILITY.

817/01639

**⚠ WARNING**  
 BEWARE OF FAN  
 SWITCH OFF ENGINE

817/03150





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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 a 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	10.7 litres (2.4 UK gal)	<b>JCB Super Multigrade 15W/40</b> -10 °C to 50 °C (14 °F to 122 °F)  <b>JCB Super Multigrade 10W/30</b> -15 °C to 40 °C (5 °F to 104 °F)	CF-4/SG, SAE15W/40  CF-4/SG, SAE10W/30
Hydraulic System Hydraulic Tank	70 litres (15.4 UK gal) 58 litres (12.75 UK gal)	<b>JCB Super Multigrade 10W/30</b> <b>JCB Super Multigrade 15W/40</b> (top up only)	CF-4/SG, SAE10W/30 CF-4/SG, SAE15W/40
* Cooling System Antifreeze Total coolant	5.5 litres (9.7 UK pints) 11 litres (19.4 UK pints)	<b>JCB Four Seasons Antifreeze &amp; Summer Coolant/water</b> (see <i>Coolant Mixtures</i> )	ASTM D3306, BS6580
Fuel System	99 litres (21.8 UK gal)	Diesel oil (see <i>Types of Fuel</i> )	ASTM D975-66T Nos. 1D, 2D
* Grease Points	-	<b>JCB HP Grease</b>  <b>or JCB Special MPL-EP Grease</b>	Lithium complex NLGI No. 2 consistency including extreme pressure additives. Lithium based NLGI No. 2 consistency including extreme pressure additives.
Chain Case	Fill to level plug	Engine Oil	

## North American Capacities and Lubricant Equivalents

ITEM	CAPACITY	FLUID/LUBRICANT	SPECIFICATION
Engine Oil	10.7 litres (2.8 US gal)	<b>JCB 15W/40 Engine Oil</b> 14 °F to 122 °F (-10 °C to +50 °C)  <b>JCB Engine Oil 10W</b> -4 °F to +50 °F (-20 °C to +10 °C)	CF-4/SG, SAE 15W/40  CF-4/SG, SAE 10W
* Hydraulic System Hydraulic Tank	70 litres (18.5 US gal) 58 litres (15.3 US gal)	<b>JCB 30W</b> <b>JCB 15W/40</b> (top up only)	API CD/CE MIL-L-2104D
* Cooling System Antifreeze Total coolant	5.5 litres (11.6 US pints) 11 litres (23 US pints)	<b>Permanent Antifreeze</b>	ASTM D3306-74
Fuel System	99 litres (26 US gal)	Diesel oil (see <i>Types of Fuel</i> )	ASTM D975-66T Nos. 1D, 2D
Grease Points	-	<b>JCB Moly EP #2 Grease</b>	Lithium based, No. 2
Chain Case	Fill to level plug	Engine Oil	

Sample of manual. Download All 229 pages at:

<https://www.aresairmanual.com/downloads/jcb-robot-1851105-skid-steer-loader-service-repair-manual/>