Product: JCB 1CX,208S Backhoe Loader Service Repair Manual(PN-9803/8550)
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Open front screen

Service Manual

1CX, 208S Backhoe Loader

PUBLISHED BY THE
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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:

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.

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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.

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.

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

Green: Exhaust

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

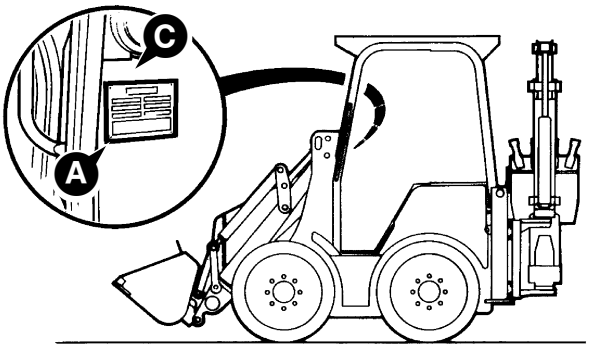
Yellow: Oil trapped within a chamber or line, preventing movement of components (lock-up).

Orange: Oil pressure used in a controlling device (servo).

Contents Page No.

Machine Identification Plate

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



203650

Typical Vehicle Identification Number (VIN)

SLP	1CX	S	B	V	E	751601
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)

JCB COMPACT PRODUCTS LIMITED
HAREWOOD ESTATE, LEEK ROAD,
CHEADLE, STOKE ON TRENT,
UNITED KINGDOM ST10 2JU

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.
160	35.7	2600	190	59.7	2200
170	37.3	2800	190 HF	59.7	2200
170 HF	37.3	2800	1110	68.6	2200
160 HF	35.7	2600	1110 HF	68.6	2200
1CX	37.3	2800	1CX HF	37.3	2800
180	44.7	2800	180 HF	44.7	2800

817/19702

Unit Identification

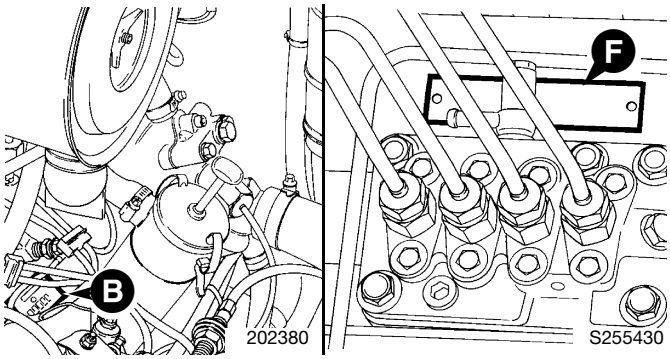
The engine serial number on XUD engines is stamped on an aluminium plate **B** on the side of the cylinder block. On Perkins engines the number is stamped on a label **F** on the right side of the cylinder block.

The chassis serial number **C** is stamped on the front wall of the cab above the machine identification plate.

The hydraulic motors have the date of manufacture stamped on a plate as shown at **D**.

The hydraulic pump unit serial number is stamped on a plate on the bottom of the pump as shown 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.



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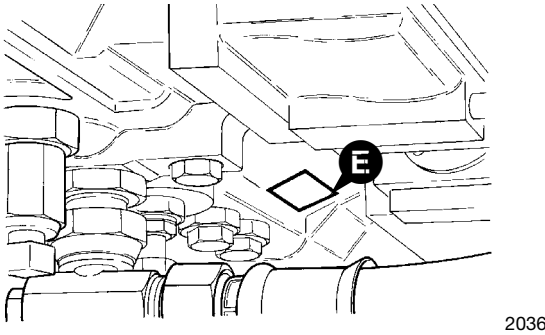
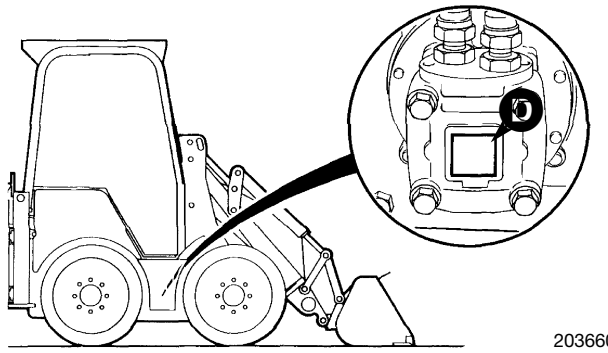


203640



203660

Left Side, Right Side

In this manual, 'left' and 'right' mean your left and right when you are seated correctly in the machine, facing the loader.

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.

BSP Adapters with Bonded Washers.

Adapter Size in	Spanner size mm	Torque Settings Nm	kgf m	lbf ft
1/8	11	20	2.0	15
1/4	19	34	3.5	25
3/8	22	75	7.6	55
1/2	27	102	10.4	75
5/8	30	122	12.4	90
3/4	32	183	18.7	135
1	38	203	20.7	150
1 1/4		305	31.1	225
1 1/2		305	31.1	225

SAE Adapters with 'O' rings.

Adapter Size in	Torque Settings Nm	kgf m	lbf ft
7/16	20	2.0	15
9/16	35	3.6	26
3/4	81	8.3	60
7/8	108	11.0	80
1 1/16	183	18.7	135
1 5/16	298	30.4	220
1 5/8	380	38.8	280

Hydraulic Coned BSP Hoses.

Hose Size in	Spanner size mm	Torque Settings Nm	kgf m	lbf ft
1/8	14	14	1.4	10
1/4	19	27	2.7	20
3/8	22	40	4.0	29
1/2	27	55	5.6	40
5/8	30	65	6.6	48
3/4	32	95	9.7	70
1	38	120	12.2	88
1 1/4		189	19.3	139
1 1/2		244	24.9	180

'O' Ring Face Seal System

Adaptors screwed into valve blocks

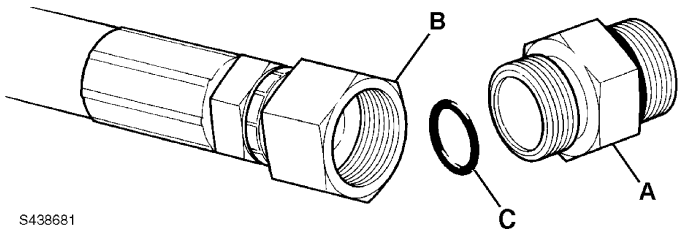
Adaptors screwed into valve blocks, etc. seal onto an 'O' ring which is compressed into a 45° seat machined in the face of the tapped port.

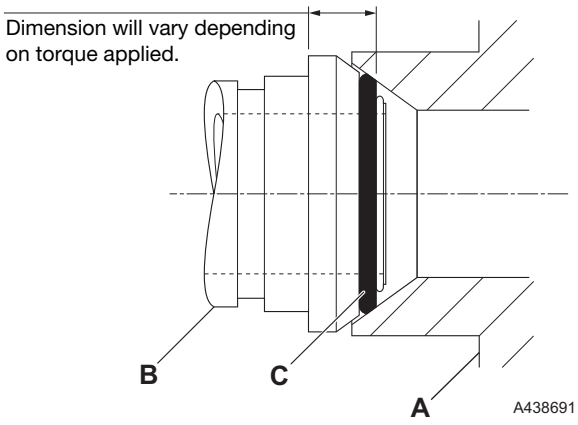
Adaptor Size	Common Spanner Size (A/F) mm	in.	Tightening Torque Nm	lbf ft
1/4" BSP	19	0.75	18	13
3/8" BSP	22	0.875	31	23
1/2" BSP	27	1	49	36
5/8" BSP	30		60	44
3/4" BSP	32	1.25	81	60
1" BSP	38	1.5	129	95
1 1/4" BSP			206	152

SAE Tube Size	SAE Port Thread Size	Common Spanner Size (A/F) mm	in.	Tightening Torque Nm	lbf ft
4	7/16 - 20	15.9	0.625	20 - 28	16.5 - 18.5
6	9/16 - 18	19.1	0.750	46 - 54	34 - 40
8	3/4 - 16	22.2	0.875	95 - 105	69 - 77
10	7/8 - 14	27.0	1.063	130 - 140	96 - 104
12	1.1/16 - 12	31.8	1.250	190 - 210	141 - 155
16	1.5/16 - 12	38.1	1.500	290 - 310	216 - 230
20	1.5/8 - 12	47.6	1.875	280 - 380	210 - 280

Hoses Screwed onto Adaptors

Hoses **B** screwed onto adaptors **A** etc. seal onto an 'O' ring **C** which is compressed into a 45° seat machined in the face of the adaptor port.

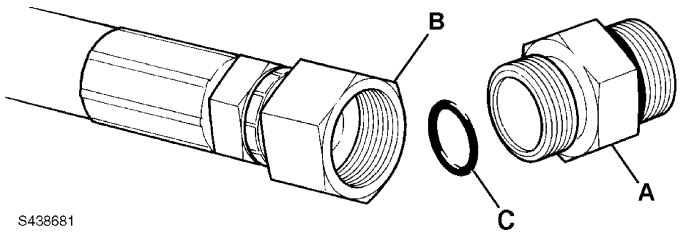


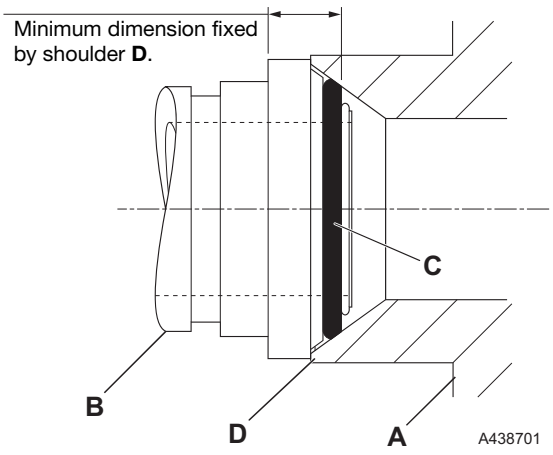


Hose Size	Common Spanner Size (A/F) mm	in.	Tightening Torque Nm	lbf ft
1/8" BSP	14		14	10
1/4" BSP	19	0.75	24	18
3/8" BSP	22	0.875	33	24
1/2" BSP	27	1	44	33
5/8" BSP	30		58	43
3/4" BSP	32	1.25	84	62
1" BSP	38	1.5	115	85
1 1/4" BSP			189	140
1 1/2" BSP			244	180

'Torque Stop' Hose System

'Torque Stop' Hoses **B** screwed onto adaptors **A** etc. seal onto an 'O' ring **C** which is compressed into a 45° seat machined in the face of the adaptor port. To prevent the 'O' ring being damaged as a result of over tightening, 'Torque Stop' Hoses have an additional shoulder, which acts as a physical stop.





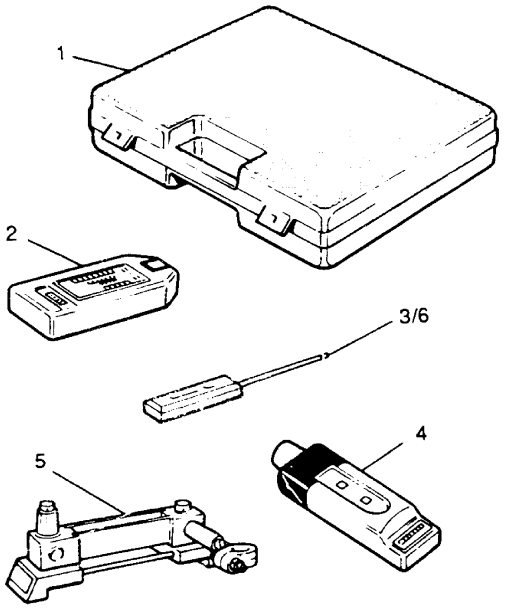
Hose Size	Common Spanner Size (A/F) mm	in.	Tightening Torque Nm	lbf ft
1/8" BSP	14		14	10
1/4" BSP	19	0.75	27	20
3/8" BSP	22	0.875	40	30
1/2" BSP	27	1	55	40
5/8" BSP	30		65	48
3/4" BSP	32	1.25	95	70
1" BSP	38	1.5	120	89
1 1/4" BSP			189	140
1 1/2" BSP			244	180

Numerical List

The following parts are replacement items for kits and would normally be included in the kit numbers quoted above.

Replacement items for kit no. 892/00253

Section C - Electrics

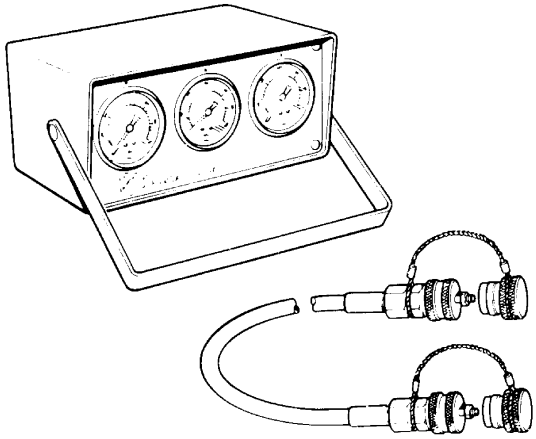


S188230

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

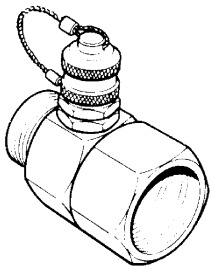
Section E - Hydraulics



188120

Hydraulic Circuit Pressure Test Kit

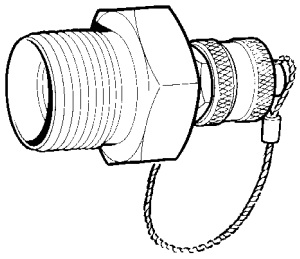
892/00253	Pressure Test Kit
892/00201	Replacement Gauge 0-20 bar (0-300 lbf/in^2)
892/00202	Replacement Gauge 0-40 bar (0-600 lbf/in^2)
892/00203	Replacement Gauge 0-400 bar (0-400 lbf/in^2)
892/00254	Replacement Hose



188130

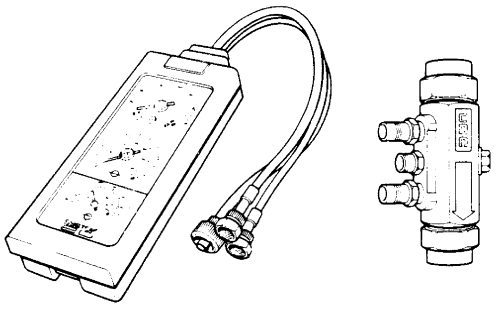
Pressure Test 'T' Adapters

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



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

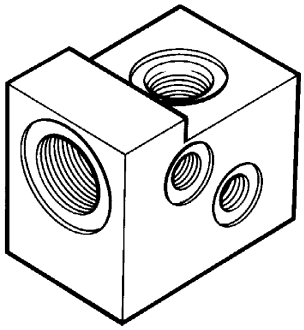


188150

Flow Test Equipment

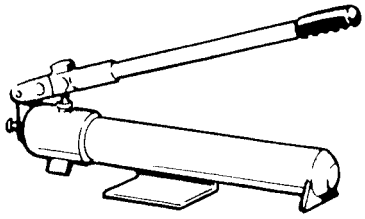
892/00268	Flow Monitoring Unit
892/00269	Sensor Head 0 - 100 l/min (0 - 22 UK gal/min)
892/00270	Load Valve
1406/0021	Bonded Washer
1604/0006	Adapter 3/4 in M x 3/4 in M BSP
1612/0006	Adapter 3/4 in F x 3/4 in M BSP
892/00271	Adapter 3/4 in F x 5/8 in M BSP
892/00272	Adapter 5/8 in F x 3/4 in M BSP
816/20008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

Section E - Hydraulics



S220840

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



193850

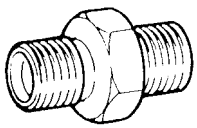
Hand Pump Equipment

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 - 60 lbf/in^2)
892/00279	Gauge 0 - 400 bar (0 - 600 lbf/in^2)

188140

Bonded Washers

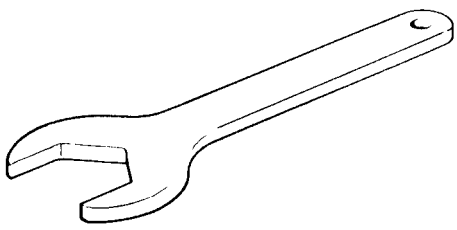
1406/0011	1/4 in BSP
1406/0018	1/2 in BSP
1406/0021	3/4 in BSP
1406/0029	1.1/4 in BSP



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

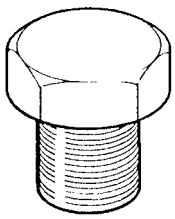


193930

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

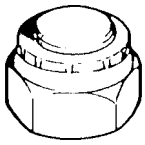
Section E - Hydraulics



193870

Female Cone Blanking Plug

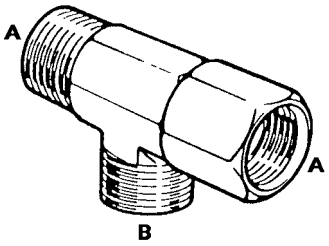
892/00055	1/4 in BSP
892/00056	3/8 in BSP
892/00057	1/2 in BSP
892/00059	3/4 in BSP
892/00060	1 in BSP'T'



193880

Male Cone Blanking Plug

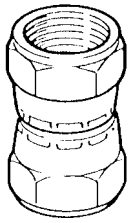
816/00294	1/4 in BSP
816/00189	3/8 in BSP
816/00190	1/2 in BSP
816/00197	5/8 in BSP
816/00196	3/4 in BSP
816/00193	1 in BSP



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)



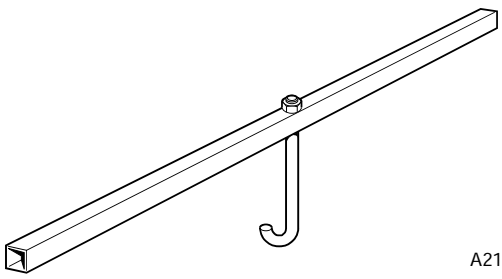
193900

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

193920

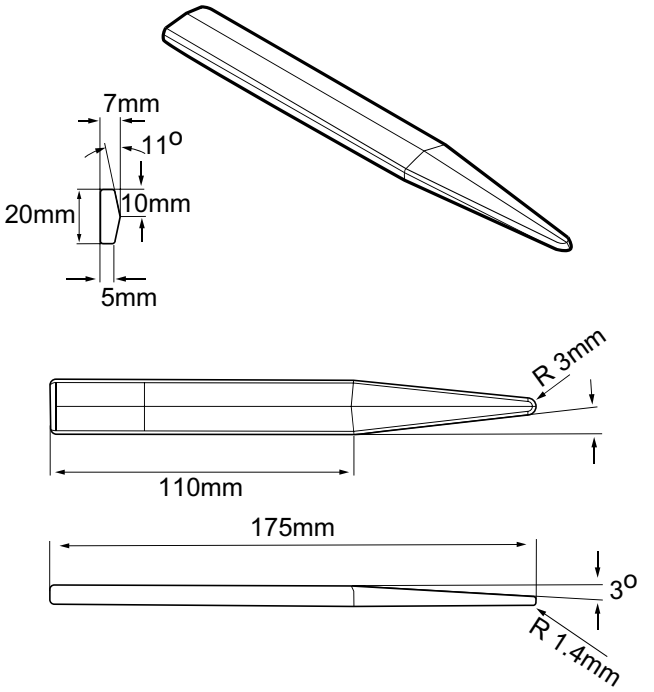
* 993/99510 Half Moon Spanner - for pump lower mounting bolt



A215880

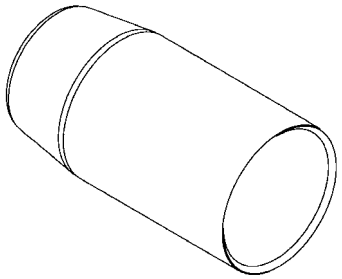
* 892/00858 Pump support bracket - for engine removal

Section E - Hydraulics



892/01027 Piston Seal Assembly Tool

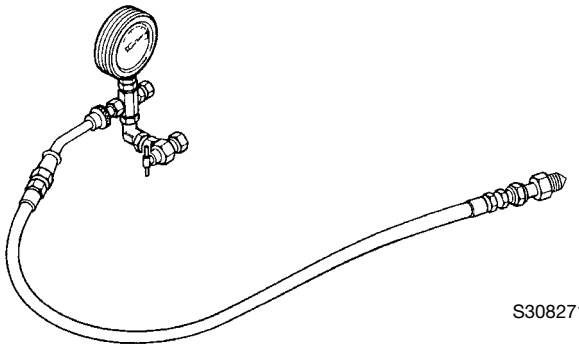
338500



S338410

Ram Seal Protection Sleeves

892/01017 For 30 mm Rod Diameter
892/01018 For 40 mm Rod Diameter



S308271

*892/00948 Nitrogen Charging Tool

JCB Multi-Gasket	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65 mm diameter.	4102/1201	
JCB High Strength Threadlocker	A high strength locking fluid for use with threaded components.	4102/0551	
JCB Retainer (High Strength)	For retaining parts which are unlikely to be dismantled.	4101/0651	
JCB Threadlocker & Sealer	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.	4101/0251	
JCB Threadlocker & Sealer (High Strength)	A medium to high strength locking fluid for retention and sealing of ram piston heads.	4101/0552	
JCB Threadlocker	A locking fluid for use on threads larger than 50 mm dia.	4101/0451	
JCB Activator	A cleaning primer which speeds the curing rate of anaerobic products.	4104/0251 4104/0253	Aerosol Bottle
JCB Cleaner/Degreaser	For degreasing components prior to use of anaerobic adhesives and sealants.	4104/1557	Aerosol

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
JCB High Strength Threadlocker	4102/0502	**JCB High Strength Threadlocker**	4102/0551
JCB High Strength Retainer	4101/0602	**JCB Retainer (High Strength)**	4101/0651
JCB Lock & Seal	4101/0202	**JCB Threadlocker & Sealer**	4101/0251
Loctite 243	4101/1101	Use 4101/0251	
Loctite 262	4101/0502	**JCB Threadlocker & Sealer (High Strength)**	4101/0552
Loctite 932	4101/0402	**JCB Threadlocker**	4101/0451
Loctite Activator N	4104/0101 Aerosol 4104/0102 Bottle	**JCB Activator**	4104/0251 4104/0253
JCB Cleaner & Degreaser	4104/1538 Aerosol	**JCB Cleaner/Degreaser**	4104/1557

Contents

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

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

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or whilst operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9

⚠ 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

⚠ CAUTION

Lifting the Machine

When lifting the machine using the mainframe lifting points it is necessary to use a lifting frame to prevent the chains causing damage to the ROPS/FOPS structure.

GEN 9-1

⚠ 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

⚠ WARNING

Soft Ground

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

INT-3-2-4

Operating Safety

⚠ WARNING

Practice

You or others can be killed or seriously injured if you do unfamiliar operations without first practising them. Practise away from the work site on a clear area. Keep other people away. Do not perform new operations until you are sure you can do them safely.

INT-2-1-1

⚠ 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

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

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

Passengers

Passengers in or on the machine can cause accidents. The JCB 1CX is a one man machine. Do not carry passengers.

INT-2-2-2

⚠ 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

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

⚠ CAUTION

Cleaning

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

INT-3-2-11

⚠ 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 and/or damage.

INT-3-1-4

⚠ 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

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

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

⚠ 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

Maintenance Safety (cont'd)

⚠ 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

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

⚠ CAUTION

Non-approved modifications to drive ratios, machine weight or wheel and tyre sizes may adversely affect the performance of the parking brake.
3-2-3-11/1

⚠ 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

⚠ 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

⚠ 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

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

⚠ 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

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

⚠ 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

⚠ 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

Maintenance Safety (cont'd)

⚠ 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

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.

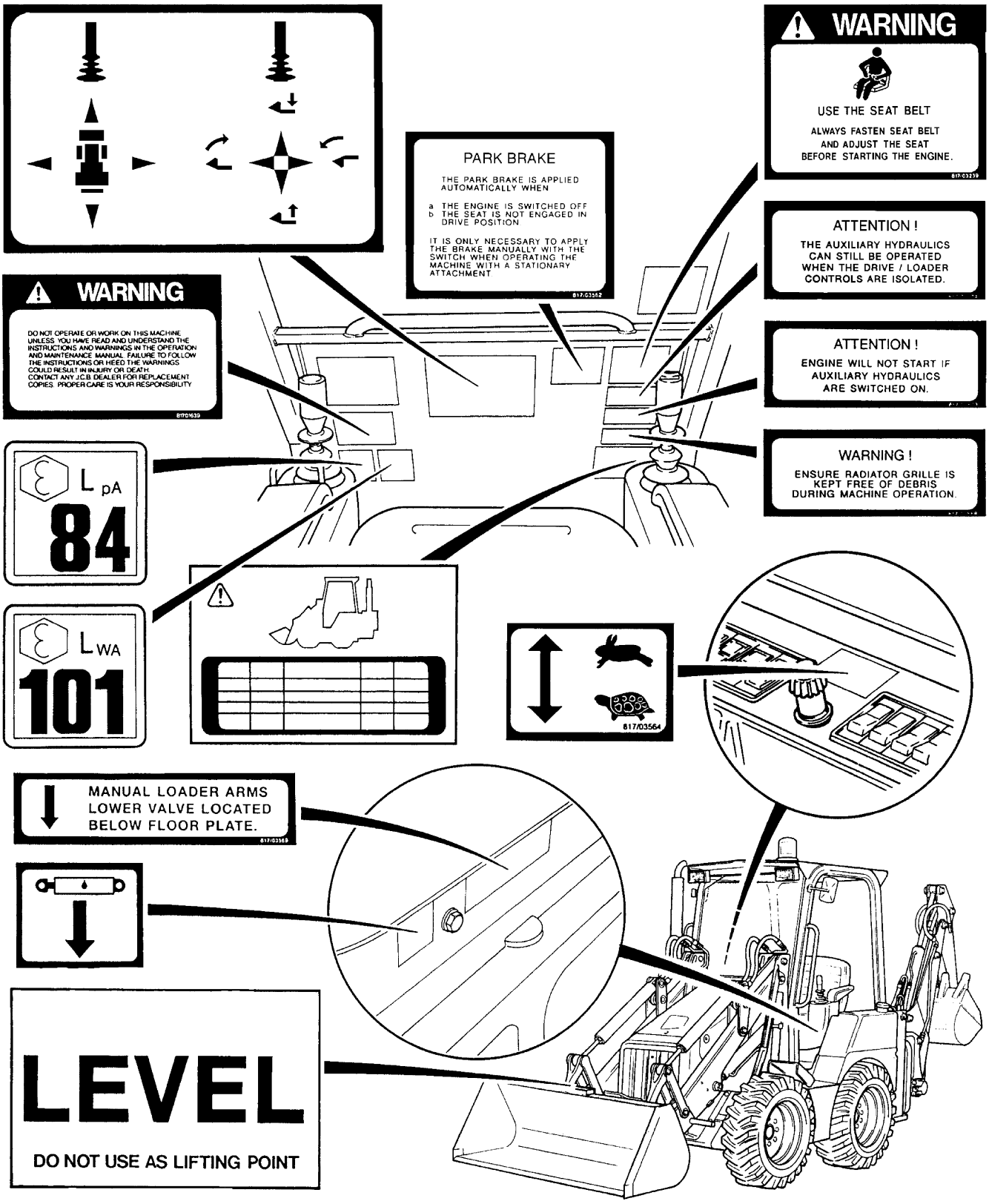
INT-3-3-3

⚠ 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)



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Contents

Fluids, Capacities and Lubricants - except North America

ITEM	CAPACITY	FLUID/LUBRICANT	SPECIFICATION
* **Engine Oil**			
XUD	5 litres	**JCB High Performance 15W/40**	ACEA E2:B2:A2, API CF4/SG
100 series up to m/c no. 807552	8.2 litres		
400 series from m/c no. 807553	10.5 litres		
Hydraulic System	45 litres	**JCB High Performance 10W/30** **JCB High Performance 15W/40** (top up only)	ACEA E2:B2:A2, API CF4/SG ACEA E2:B2:A2, API CF4/SG
Cooling System			
XUD			
Total coolant cap.	11 litres	Water/Anti-freeze	Inhibited Ethanediol AL - 39 11
Antifreeze	5.5 litres	(see ***Coolant Mixtures***)	
100 and 400 series			
Total coolant cap.	11 litres	**JCB Four seasons Antifreeze**	ASTM D3306, BS6580
Antifreeze	5.5 litres	**& Summer Coolant/water**	
		(see ***Coolant Mixtures***)	
Fuel System	45 litres	Diesel oil (see ***Types of Fuel)***	ASTM D975-66T Nos. 1D, 2D
Grease Points	-	**JCB Special HP Grease**	Lithium complex NLGI No. 2 consistency including extreme pressure additives
		or **JCB Special MPL-EP Grease**	Lithium based NLGI No. 2 consistency including extreme pressure additives
Chain Case	Fill to level plug	Engine Oil	
Slew Oil up to m/c no. 807225	Fill to level mark	**JCB HD90 Gear Oil**	API GL 5
Slew Oil from m/c no. 807226	Fill to level plug	**JCB High Performance 10W/30**	ACEA E2:B2:A2, API CF4/SG

Fluids, Capacities and Lubricants - North America

ITEM	CAPACITY	FLUID/LUBRICANT	SPECIFICATION
* **Engine Oil**			
XUD	1.32 US gal	**JCB Genuine Engine Oil 15W/40**	CH-4/SJ, SAE 15W 40
100 series up to m/c no. 807552	2.17 US gal		
400 series from m/c no. 807553	2.8 US gal		
* **Hydraulic System**	11.89 US gal	**JCB Genuine Engine Oil 10W/30** **JCB Genuine Engine Oil 15W/40** (top up only)	CH-4/SJ, SAE 10W 30 CH-4/SJ, SAE 15W 40
Cooling System			
XUD			
Total coolant cap.	2.9 US gal	Water/Anti-freeze	Inhibited Ethanediol AL - 39 11
Antifreeze	1.45 US gal	(see ***Coolant Mixtures***)	
100 and 400 series			
Total coolant cap.	2.9 US gal	**Permanent Antifreeze**	ASTM D3306, BS6580
Antifreeze	1.45 US gal		
Fuel System	11.89 US gal	Diesel oil (see ***Types of Fuel)***	ASTM D975-66T Nos. 1D, 2D
Grease Points	-	**JCB Moly EP #2 Grease**	Lithium complex NLGI #2 consistency including extreme pressure additives
Chain Case	Fill to level plug	Engine Oil	
Slew Oil up to m/c no. 807225	Fill to level mark	**Gear Oil EP90**	API GL 5
Slew Oil from m/c no. 807226	Fill to level plug	**JCB 30W**	API CD/CE

It is most important that you read and understand this information and the publications referred to. Make sure all your colleagues who are concerned with lubricants read it too.

Lubricants - Health and Safety

Hygiene

JCB lubricants are not a health risk when used properly for their intended purposes.

However, excessive or prolonged skin contact can remove the natural fats from your skin, causing dryness and irritation.

Low viscosity oils are more likely to do this, so take special care when handling used oils, which might be diluted with fuel contamination.

Whenever you are handling oil products you should maintain good standards of care and personal and plant hygiene. For details of these precautions we advise you to read the relevant publications issued by your local health authority, plus the following.

Storage

Always keep lubricants out of the reach of children.

Never store lubricants in open or unlabelled containers.

Waste Disposal

All waste products should be disposed of in accordance with all the relevant regulations.

The collection and disposal of used engine oil should be in accordance with any local regulations. Never pour used engine oil into sewers, drains or on the ground.

Handling

New Oil

There are no special precautions needed for the handling or use of new oil, beside the normal care and hygiene practices.

Used Oil

Used engine crankcase lubricants contain harmful contaminants.

Here are precautions to protect your health when handling used engine oil:

1 Avoid prolonged, excessive or repeated skin contact with used engine oils.

2 Apply a barrier cream to the skin before handling used engine oil.

3 Note the following when removing engine oil from skin:

- **a** Wash your skin thoroughly with soap and water.
- **b** Using a nail brush will help.
- **c** Use special hand cleansers to help clean dirty hands.
- **d** Never use petrol, diesel fuel, or paraffin for washing.
- **e** Avoid skin contact with oil soaked clothing.
- **f** Don't keep oily rags in pockets.
- **g** Wash dirty clothing before re-use.
- **h** Throw away oil-soaked shoes.

First Aid - Oil

Eyes
In the case of eye contact, flush with water for 15 minutes. If irritation persists, get medical attention.

Swallowing
If oil is swallowed do not induce vomiting. Get medical advice.

Skin
In the case of excessive skin contact, wash with soap and water.

Spillage

Absorb on sand or a locally approved brand of absorbent granules. Scrape up and remove to a chemical disposal area.

Fires

Extinguish with carbon dioxide, dry chemical or foam. Fire-fighters should use self-contained breathing apparatus.

⚠ WARNING

Do not use water to put out an oil fire. This will only spread it because oil floats on water.

Extinguish oil and lubricant fires with carbon dioxide, dry chemical or foam. Fire-fighters should use self-contained breathing apparatus.
7-3-1-3/1

Fuel System

Types of Fuel

Use good quality diesel fuel to get the correct power and performance from your engine. The recommended fuel specification for JCB engines is given below.

Cetane Number:	45 (minimum)
Viscosity:	2.5/4.5 Centistokes at 40°C (104°F)
Density:	0.835/0.855 kg/litre (0.872/0.904 lb/pint)
Sulphur:	0.5% of mass (maximum)
Distillation:	85% at 350 °C (662 °F)

Cetane Number

Indicates ignition performance. Fuel with a low cetane number can cause cold start problems and affect combustion.

Viscosity

Is the resistance to flow. If this is outside limits, the engine performance can be affected.

Density

Lower density will reduce engine power. Higher density will increase both engine power and exhaust smoke.

Sulphur

High sulphur content can cause engine wear. (High sulphur fuel is not normally found in North America, Europe or Australia.) If you have to use high sulphur fuel you must also use a highly alkaline engine lubricating oil; or change the normal oil more frequently.

Distillation

This indicates the mixture of different hydrocarbons in the fuel. A high ratio of lightweight hydrocarbons can affect the combustion characteristics.

Fuel Standards

Consult your fuel supplier or JCB distributor about the suitability of any fuel you are unsure of.

Low Temperature Fuels

Special winter fuels may be available for engine operation at temperatures below 0 °C (32 °F). These fuels have a lower viscosity. They also limit wax formation in the fuel at low temperatures. (Wax forming in the fuel can stop the fuel flowing through the filter).

Flow improvers may also be available. These can be added to the fuel to reduce wax formation.

Petrol

⚠ WARNING

Do not use petrol in this engine. Do not mix petrol with the diesel fuel. In storage tanks the petrol could rise to the top and form flammable vapours.
INT-3-1-6

Advice

If you have to use non-standard fuels, contact your JCB distributor for advice on engine adjustments and oil change periods.

* Fatty Acid Methyl Ester Fuels as a replacement for Diesel Fuels

Fuel resources such as Rape Methyl Ester and Soybean Methyl Ester, collectively known as Fatty Acid Methyl Esters, are being used as alternatives and extenders for mineral oil.

Fatty Acid Methyl Esters must conform to certain standards to be of acceptable quality, just as mineral oils do at present.

Consult your JCB distributor for advice about the use of Fatty Acid Methyl Ester fuels as improper application may impair engine performance.

Filling the Tank

⚠ WARNING

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.
INT-3-2-2

At the end of every working day, fill the tank with the correct type of fuel.

This will prevent condensation from developing in the fuel tank overnight.

We recommend that, if possible, you lock the fuel cap to prevent theft and tampering.

Service Schedules

EVERY 10 OPERATING HOURS OR DAILY
whichever occurs first, for the first 50 Operating Hours only

Check (engine stopped)

1 Tightness of wheel bolts

EVERY 10 OPERATING HOURS OR DAILY
whichever occurs first

Clean

1 Machine generally, including cab interior

Check (Engine Stopped)

1 Generally for damage, including ROPS/FOPS structure
2 Engine coolant level and condition
3 Fuel system for leaks and contamination
4 Hydraulic fluid level
5 Hydraulic system for leaks
6 Engine oil level and condition
7 Engine generally for leaks
8 Tyre pressures and condition
9 Windscreen washer level (if fitted)
10 Alternator belt tension (100 & 400 series engines only)
11 Fuel filter - drain if necessary (XUD engine only)
12 Seat belt condition and security
13 Slew oil level

Check (Engine Running)

1 Warning lights extinguished
2 Operation of all electrical equipment
3 Exhaust for excessive smoke
4 Operation of all hydraulic services

Grease

1 Quickhitch pivot points
2 Loader arm pivot points
3 Backhoe pivot points

EVERY 50 OPERATING HOURS OR WEEKLY
whichever occurs first

Do the Daily jobs plus:

Check (Engine Stopped)

1 Oil cooler connections
2 Radiator hoses and condition
3 Alternator belt tension
4 Fuel filter - drain if necessary

Clean

1 Quickhitch square locking peg housings.

EVERY 100 OPERATING HOURS OR 2 WEEKLY
whichever occurs first

Do the Daily and 50 hour jobs plus:

Clean

1 Battery terminals
2 Air filter outer element when operating in dusty conditions

Check (Engine Stopped)

1 Condition of ram piston rods
2 Hoses and pipework for chafing and damage
3 Air cleaner hose security
4 Wiring for chafing

Oil

1 All linkage points
2 Door hinges (cabbed version)

*** Refer to next page for 250 to 2000 Hour Services**

Product: JCB 1CX,208S Backhoe Loader Service Repair Manual(PN:9803/8550)
Full Download: https://www.arepairmanual.com/downloads/jcb-1cx208s-backhoe-loader-service-repair-manualpn-98038550/

Service Schedules

Pre-start Cold Checks Service Points and Fluid Levels	250 Hr	500 Hr	1000 Hr	2000 Hr
ENGINE				
Engine and Pump Mount Security	☐	☐	☐	☐
Oil and Filter - Change (see Note 4)	☐	☐	☐	☐
Coolant Level and Antifreeze Strength	☐	☐	☐	☐
Coolant Change				☐
Air Cleaner Dust Valve - Clean	☐	☐	☐	☐
Air Cleaner Outer Element - Change (see note 1)		☐	☐	☐
Air Cleaner Inner Element - Change			☐	☐
Cylinder Head Nuts (100 series only)			☐	☐
Valve Clearances - Check and Adjust (not XUD)			☐	☐
Fan Belt Tension/Condition	☐	☐	☐	☐
Fan Belt - Change (not XUD)			☐	☐
Fuel Sedimenter - Drain	☐	☐	☐	☐
Fuel Filter - Change (XUD)		☐	☐	☐
Fuel Filter - Change (100 series)	☐	☐	☐	☐
Radiator Hose - Condition	☐	☐	☐	☐
Cam Belt - Condition (XUD only)			☐	☐
Cam Belt - Change (XUD only)				☐
Air Cleaner Hose Security	☐	☐	☐	☐
Fuel System for Leaks and Contamination	☐	☐	☐	☐
External Oil Leaks	☐	☐	☐	☐
Clean Radiator Matrix and Oil Cooler	☐	☐	☐	☐
TRANSMISSION				
Motor Mounting Bolts - Tightness	☐	☐	☐	☐
Wheel Nut Security	☐	☐	☐	☐
Hub Mounting Bolt Security	☐	☐	☐	☐
Tyre Pressures - (See Handbook)	☐	☐	☐	☐
Drive Chain Case Oil Level - Check	☐	☐	☐	
Drive Chain Case Oil - Change				☐
Drive Chain Tension - Check and Adjust			☐	☐
HYDRAULICS				
Oil - Sample/Change (Clean Suction Strainer)				☐
Oil Level	☐	☐	☐	☐
Oil Filter - Change (see note 3)	☐	☐	☐	☐
Ram Piston Rods for Damage/Leaks	☐	☐	☐	☐
Hoses - Damage or Leaks	☐	☐	☐	☐
Pipework - Damage or Leaks	☐	☐	☐	☐
Breather - Clean (Change at 1000 hrs-see note 2)	☐	☐	☐	☐
ELECTRICS				
Battery Electrolyte Level - Check (If applicable)		☐	☐	☐
Battery Charge Condition		☐	☐	☐
Battery Terminals for Condition and Tightness	☐	☐	☐	☐
Wiring for Chafing	☐	☐	☐	☐
BODY AND FRAMEWORK				
All Pivot Pins - Check and Grease	☐	☐	☐	☐
All Hinges - Lubricate	☐	☐	☐	☐
All Linkages - Lubricate	☐	☐	☐	☐
Slew Oil Level	☐	☐	☐	☐
General Damage including ROPS/FOPS	☐	☐	☐	☐
Seat Belt - Condition/Security	☐	☐	☐	☐
Windscreen Washer Level (if fitted)	☐	☐	☐	☐
Quickhitch Locking Peg Housings - Clean	☐	☐	☐	☐
CAB				
Cab Heater filter - Clean		☐	☐	☐

Functional Test and Final Inspection	250 Hr	500 Hr	1000 Hr	2000 Hr
ENGINE				
Idle Speed - Check and Adjust	☐	☐	☐	☐
Maximum No-load Speed - Check and Adjust	☐	☐	☐	☐
Exhaust System Security/Fouling	☐	☐	☐	☐
Exhaust for Excessive Smoke	☐	☐	☐	☐
Throttle System and Control Cable	☐	☐	☐	☐
TRANSMISSION				
Transmission Stall Pressure - Check			☐	☐
HYDRAULICS				
Operation All Services	☐	☐	☐	☐
MRV Pressure - Check and Adjust			☐	☐
Auxiliary Circuit - Check/Adjust			☐	☐
Control Isolation - Check	☐	☐	☐	☐
Pressure Reducing Valve - Check and Adjust			☐	☐
Excavator Valve and Controls	☐	☐	☐	☐
Hydraclamp Operation	☐	☐	☐	☐
BRAKES				
Parking Brake - Operation	☐	☐	☐	☐
ELECTRICS				
Starter Motor - Check	☐	☐	☐	☐
Alternator - Check	☐	☐	☐	☐
Gauges and Warning Lights - Check	☐	☐	☐	☐
Front Wiper Motor - Check (if fitted)	☐	☐	☐	☐
Cab Switches - Check Operation	☐	☐	☐	☐
Horn Operation	☐	☐	☐	☐
Heater (if fitted)	☐	☐	☐	☐
Reverse Alarm (if fitted)	☐	☐	☐	☐
Lights and Indicators (if fitted)	☐	☐	☐	☐
Operate all Electrical Equipment	☐	☐	☐	☐
ATTACHMENTS				
Attachment Condition & Operation - Check	☐	☐	☐	☐
PAINTWORK				
Condition - See Diagram on Report		☐	☐	☐
GENERAL				
Check for Fluid Leaks (e.g. coolant, engine oil, hydraulic oil, etc.	☐	☐	☐	☐

Note 1: The Air Cleaner Outer Element should be changed every 100 hours if the machine is working in dusty conditions.
Note 2: The Hydraulic Tank Breather should be changed more frequently if the machine is working in dusty conditions.
Note 3: A 5 micron filter is fitted on production. This should be replaced at the first 250 hour service with the standard 13 micron filter.
Note 4: To machine no. 807552: Oil and filter change at 250 hrs.
From machine no. 807553: Oil and filter change at 500 hrs., (provided CF4 oil is used).

Sample of manual. Download All 232 pages at:
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