

# EXCAVATOR LOADER

From Machine Serial No. 290000

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## Introduction

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

It is assumed that such personnel have at least a sound knowledge of workshop practice, safety procedures and general techniques associated with the maintenance and repair of hydraulic earthmoving equipment. Details of such are therefore generally omitted from this manual, the intention being to convey only the more specialised information concerning particular aspects of the machine or component in question.

For example, renewal of oil seals, gaskets etc. and any component showing obvious wear or damage is expected as a matter of course and information on these matters is therefore only included where a specialised procedure or range of wear tolerances is required. Similarly, it is expected that components will be thoroughly cleaned and lubricated where appropriate, also that any opened hose or pipe connections will be blanked to prevent entry of dirt and excessive loss of hydraulic fluid.

For convenience the manual is compiled in sections, e.g. "Hydraulics", "Electrics" etc., but to find details of a specific component, reference should be made to the alphabetical index at the back of the book.

Illustrations showing a dismantled component are numbered as a guide to the dismantling sequence which can generally be reversed for assembly.

Torque settings quoted are given as 'mean' figures which may be varied by  $\pm 3\%$ . 'Left Hand' and 'Right Hand' are as viewed from the rear of the machine.

\* Unless colour is used, the following coding is used on hydraulic circuit illustrations to denote various conditions of oil pressure and flow.



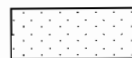
1. Neutral Circuit Pressure.



2. Pressure generated by the operation of a service. Depending on application, this may be anything between Neutral Circuit Pressure and MRV Operating Pressure.



3. Pressure that is above neutral pressure but lower than that denoted by 2.



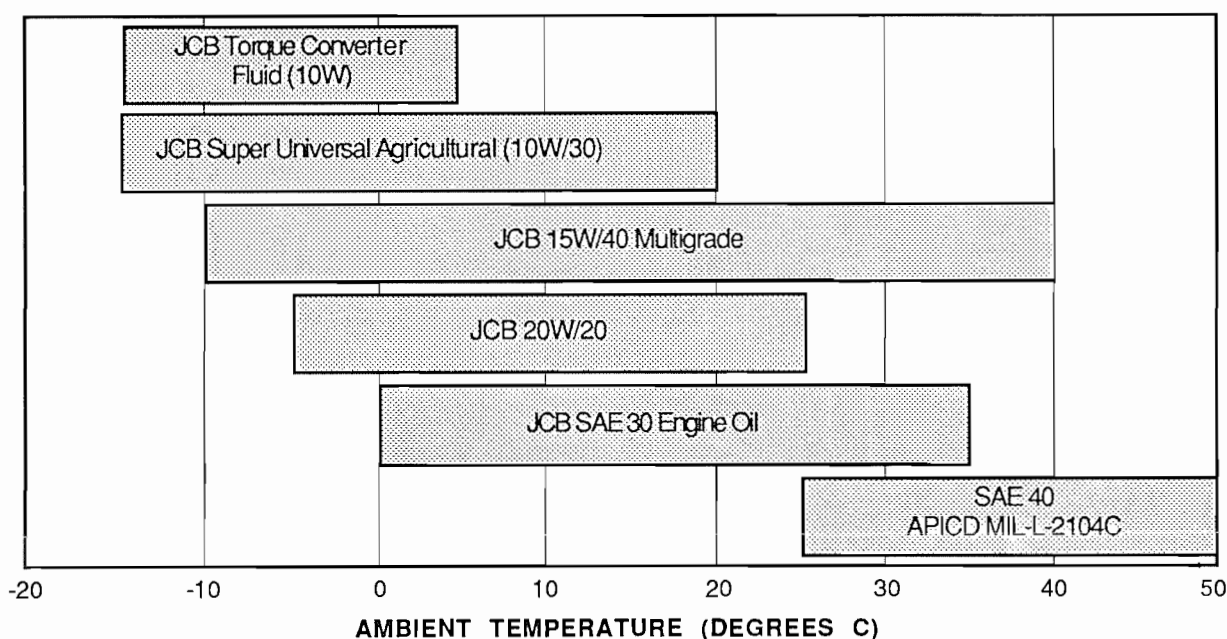
4. Exhaust.



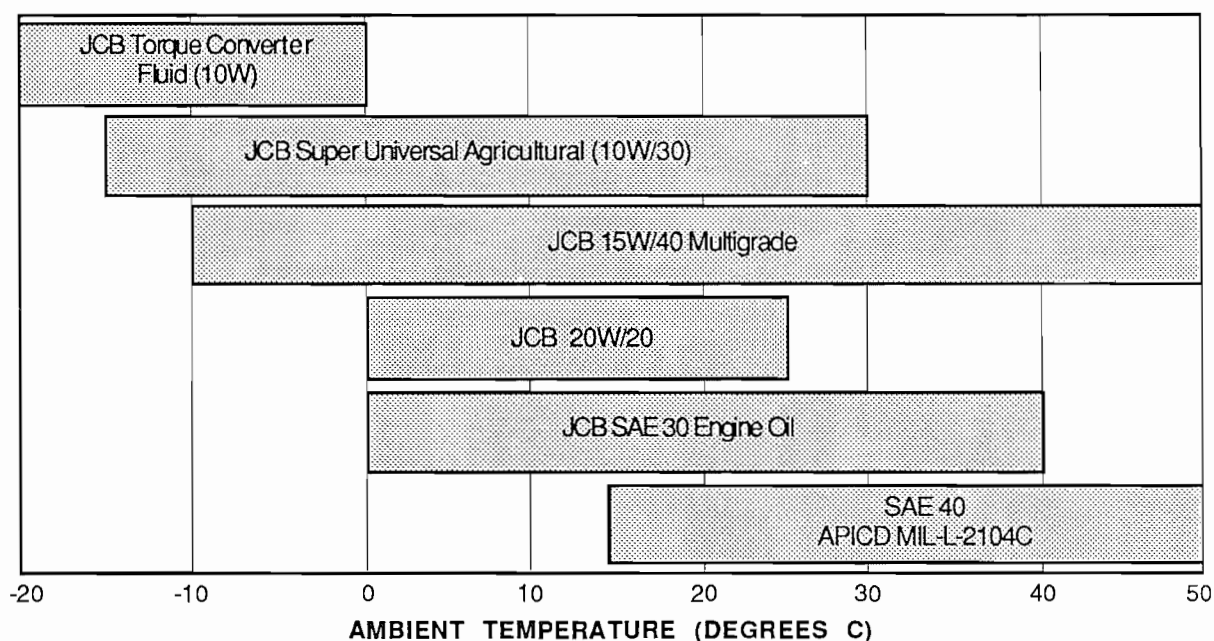
## LUBRICANTS AND CAPACITIES

Note: To promote thorough running-in, 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 recommended grade as shown in the engine 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. Alternatively, where a new or reconditioned engine requires protection against corrosion during prolonged storage, Mobilaroma 524 may be used during the storage period and during the first 100 hours operation. It is essential that both these oils are replaced by the recommended lubricant after the first 100 hours operation

### LEYLAND 4/98 ENGINE



### PERKINS 4.236 & T4236 ENGINES



1-1A

1-1A

**LUBRICANTS & CAPACITIES (continued)**

ITEM	LUBRICANT	CAPACITY	Litres	UK gal	US gal
<b>ENGINE</b>					
		4/98 Engine:	9.7	2.1	2.5
	Refer to charts on Page 1-1	4.236 Engine: †	11	2.4	2.9
		† Increased capacity for engine with hot climate oil cooler:	11.8	2.6	3.1
<b>SHUTTLE REVERSER</b> Up to machine no. 319999	† JCB Torque Converter Fluid	From dry:	11	2.4	2.9
<b>GEARBOX</b> Up to machine no. 319999	† JCB 15W/40 Multigrade		2.6	0.6	0.7
<b>JCB TRANSMISSION</b> From machine no. 320000	JCB Special Transmission Fluid	From dry: 2WD 4WD	17.25 18.25	3.8 4.0	4.5 4.8
<b>DRIVE AXLE (REAR)</b>	JCB Special Gear Oil		28	6.2	7.4
<b>DRIVE AXLE (FRONT)</b> To m/c no. 297207	††JCB HD90 Gear Oil	Differential Hubs (each)	7.0 1.5	1.5 0.3	1.8 0.4
From m/c no. 297208	††JCB HD90 Gear Oil	Differential Hubs (each)	15.0 1.3	3.3 0.3	4.0 0.3
<b>SLEW ACTUATOR</b>	††JCB HD90 Gear Oil		4.3	0.9	1.1
<b>HYDRAULIC SYSTEM</b> (including tank)			130	29	34
Below 38 deg C	JCB Special Hydraulic Fluid		Note: The capacity quoted is approximate and will vary with attachments fitted.		
Above 38 deg C	JCB High Performance Hydraulic Fluid				
<b>BRAKE SYSTEM</b>	JCB Light Hydraulic Fluid CAUTION: Do not use any other hydraulic fluid.		1.2	0.2	0.3

**LUBRICANTS & CAPACITIES (continued)**

ITEM	LUBRICANT	CAPACITY	Litres	UK Gal	US Gal
EXTENDING DIPPER	JCB Extradig Dipper Lubricant	(See WARNING below)			
ALL OTHER GREASE POINTS	†††JCB Special MPL Grease				
FUEL			90	20	24
COOLANT					
-4/98NT			13.6	3	3.6
-4/98TT			15.1	3.3	4.0
-4.236 to m/c no. 306000			17.0	3.7	4.5
-4.236 from m/c no. 306001			17.8	3.9	4.7

**\*WARNING** JCB Extradig Dipper Lubricant contains 1.53% lead. Contaminated rags, containers, etc., should only be disposed of in accordance with local regulations governing disposal of toxic waste.

† Oils marked with this symbol meet the following specifications: — API CD  
MIL-L-2104C and MIL-L-2104D  
MIL-L 46152

††JCB HD90 Gear Oil meets specifications API-GL-5 & MIL-L-2105C

†††JCB Special MPL is a lithium based no. 2 consistency grease

**\*ELECTRICAL CONNECTIONS** As a corrosion and moisture inhibitor all exposed connections should be coated liberally with petroleum jelly.

**TORQUE SETTINGS**

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

## SERVICE SCHEDULE

		Every 10 Hours	Every 50 Hours	Every 100 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours
<b>Check</b>								
Hydraulic fluid level	1	●	●	○ ●	●	●	●	
—System for leaks	2	●	●	○ ●	●	●	●	●
—Operation of all services	3	●	●	○ ●	●	●	●	●
Condition of ram piston rods	4			○ ●	●	●	●	●
Pump drive	5			○ ●	●	●	●	●
M.R.V. pressure	6					●	●	●
A.R.V. pressure	7					●	●	●
Steering relief valve pressure	8					●	●	●
Hoses/pipes for chafing or damage	9			○ ●	●	●	●	●
Engine - Cylinder head torque settings i4 - 4/98TT and 4.236 LD and LH builds - T4.236 upto Eng. No. LJ-UO27773M	14			○				
- Oil level and condition	15	●	●	○ ●	●	●	●	●
—Coolant/anti-freeze	16	●	●	○ ●	●	●	●	●
—Leaks	17	●	●	○ ●	●	●	●	●
—Idling Speed	18			○		●	●	●
—Max. governed speed	19			○		●	●	●
—Pulled down speed	20			○		●	●	●
—Exhaust (excessive smoke)	22	●	●	○ ●	●	●	●	●
—Fuel system for leaks/contamination	23			○	●	●	●	●
—Fan belt tension	24		●	○ ●	●	●	●	●
—Compression	25						●	●
—Exhaust system security	26			○		●	●	●
—Valve clearances—4/98	27			○		●	●	●
—4.236				○				●
—Mounting bolts tightness	28			○		●	●	●
—Radiator and hoses condition	29		●	○ ●	●	●	●	●
—Air cleaner hose security	30			○ ●	●	●	●	●
Wiring for chafing	34			○ ●	●	●	●	●
Operation of electrical equipment	35	●	●	○ ●	●	●	●	●
Battery electrolyte level	36							●
Instrument readings	38	●	●	○ ●	●	●	●	●
Windscreen washer bottle water	39	●	●	○ ●	●	●	●	●
*Hydraclamp adjustment	40			○ ●	●	●	●	●

○ First 100 hours or one month whichever occurs sooner

● Routine service



## SERVICE SCHEDULE

		Every 10 Hours	Every 50 Hours	Every 100 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours	*
<b>Check</b>									
Operation of transmission	42	●	●	○ ●	●	●	●	●	
Clutch oil pressures	43			○		●	●	●	
Torque converter main line pressure	44			○		●	●	●	
Shuttle reverser/transmission oil level	45	●	●	○ ●	●	●	●	●	
—Oil cooler	46		●	○ ●	●	●	●	●	
Gearbox oil level (not JCB trans.)	47		●	○ ●	●	●	●	●	
Axle oil level/leaks	48		●	○ ●	●	●	●	●	
Slewing actuator oil	49		●	○ ●	●	●	●	●	
Pivot pins and bushes	50					●	●	●	
Steering	51	●	●	○ ●	●	●	●	●	
Tyre pressures and condition	52	●	●	○ ●	●	●	●	●	
Tightness of wheel nuts	53	●	●	○ ●	●	●	●	●	
Wheel hub bearings (front)	54			○		●	●	●	
King pins and bushes	55			○		●	●	●	
Brake fluid level	56	●	●	○ ●	●	●	●	●	
Parking brake adjustment	57					●	●	●	
—operation	58	●	●	○ ●	●	●	●	●	
Footbrake operation	59	●	●	○ ●	●	●	●	●	
Operation of hose-burst check valves (if fitted)	60			○		●	●	●	
<b>Change</b>									
Engine oil	65			○	●	●	●	●	
—Oil filter element	66			○	●	●	●	●	
—Fuel filter element	67			○		●	●	●	
Air cleaner element—Outer	68						●	●	
—Inner	69							●	
Hydraulic filter element	70			○		●	●	●	
Hydraulic fluid & clean suction strainer	71							●	
Brake system fluid	72							●	
Shuttle reverser oil and clean strainer (not JCB transmission)	73						●	●	
Transmission oil filter (if fitted)	74			○		●	●	●	
Gearbox oil (not JCB transmission)	75						●	●	
JCB transmission oil and clean strainer	76			○			●	●	
Drive axle oil — rear	77						●	●	
Drive axle oil — front (4WD)	78						●	●	

## SERVICE SCHEDULE

## Clean

		Every 10 Hours	Every 50 Hours	Every 100 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours
Battery terminals	82			○ ●	●	●	●	●
Air filter dust valve	83					●	●	●
Air filter pre-cleaner (optional)	84	●	●	○ ●	●	●	●	●
Fuel lift pump	85			○		●	●	●
Engine injectors and test -4/98	86					●	●	●
-4.236								●
Fuel sediment trap and drain	87		●	○ ●	●	●	●	●
Drain fuel filter	88		●	○ ●	●	●	●	●
Cab heater filter	89			○ ●	●	●	●	●
Drain water from slew actuator	90				●	●	●	●

## Grease

Steer axle - Yoke pivot	93	●	●	○ ●	●	●	●	●
-King pins and bushes	94	●	●	○ ●	●	●	●	●
-Hubs (2WD only)	95	●	●	○ ●	●	●	●	●
-Track rod ends	96	●	●	○ ●	●	●	●	●
-Universal joints (4WD only)	97	●	●	○ ●	●	●	●	●
Steer ram grease nipples	98	●	●	○ ●	●	●	●	●
All pivot pins	99	●	●	○ ●	●	●	●	●
Pump drive shaft (if nipples fitted)	100			○ ●	●	●	●	●
Propshaft-gearbox to rear axle	101		●	○ ●	●	●	●	●
Propshaft-4WD	102		●	○ ●	●	●	●	●
Kingpost and carriage	103	●	●	○ ●	●	●	●	●
All linkage points (oil)	104			○ ●	●	●	●	●
Extending dipper	105		●	○ ●	●	●	●	●

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