SERVICE

SERVICE MANUAL

Open front screen

Wheeled Loader

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Contents

Introduction

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

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

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

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

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

Torque settings are given as a 'mean' figure which may be varied by + or - 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third. Where no figure is quoted in the text, refer to page 1/1 - 3.

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

Tone Coding

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

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

⚠ WARNING

Asbestos

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

1 Wear a face mask and gloves.

2 Work in a well ventilated area and do not smoke.

3 Do not use a rotary wire brush, use a hand scraper.

4 Make sure the material to be removed is wet with oil or water to contain loose particles.

5 Place all material into plastic bags and dispose of in accordance with local regulations.

GEN-1-8

⚠ 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.

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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).

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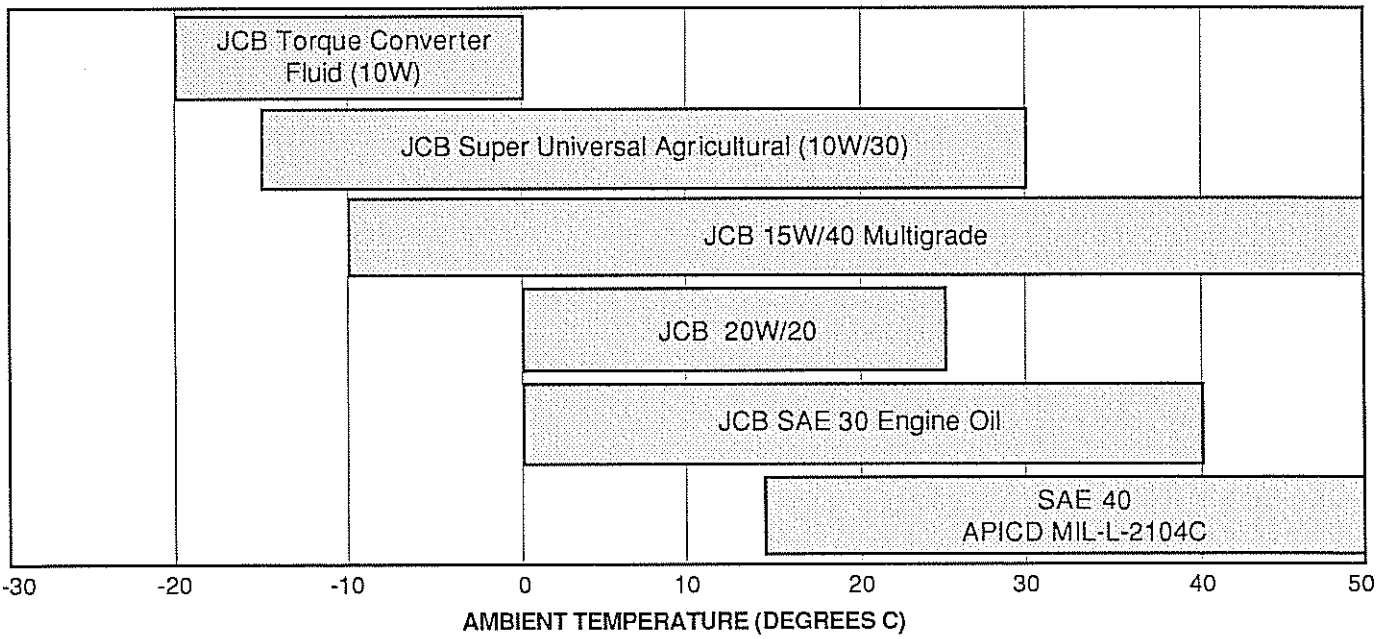
ENGINE LUBRICANTS and CAPACITIES.

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 into the machine. Alternatively, where a new or reconditioned engine requires protection against corrosion during prolonged storage, Mobilarma 524 may be used during the storage period and for the first 100 hours operation. It is essential that both these oils are replaced by the recommended lubricant after the first 100 hours operation.

Model	Lubricant	Engine	Capacity	
410	See chart below	4.98	9.7 litres	17 UK Pints
		4.236	10.8 litres	19 UK Pints
		1004 - 4HR	10.8 litres	19 UK Pints
412	See chart below	T4.236	10.8 litres	19 UK Pints
		1004 - 4THR	10.8 litres	19 UK Pints
415	See chart below	T4.236	10.8 litres	19 UK Pints
		1004-4THR	10.8 litres	19 UK Pints
420	See chart below	6.3544	14.5 litres	24 UK Pints
425	See chart below	1006 - 6H	14.5 litres	24 UK Pints
430	See chart below	T6.3544	15.6 litres	27 UK Pints

ENGINE LUBRICATION CHART



TRANSMISSION LUBRICANTS and CAPACITIES.

Model	Lubricant	Capacity	
410	+ JCB Torque Converter Fluid (SAE 10W)	14.5 litres	26 UK Pints
412	+ JCB Torque Converter Fluid (SAE 10W)	14.5 litres	26 UK Pints
415 Standard	+ JCB Torque Converter Fluid (SAE 10W)	16 litres	28 UK Pints
Swedish	+ JCB Torque Converter Fluid (SAE 10W)	14.5 litres	26 UK Pints
420	+ JCB Torque Converter Fluid (SAE 10W)	17 litres	30 UK Pints
425	+ JCB Torque Converter Fluid (SAE 10W)	18 litres	32 UK Pints
430	+ JCB Torque Converter Fluid (SAE 10W)	17 litres	30 UK Pints

***HYDRAULIC FLUIDS and CAPACITIES**

Model		Lubricant	Capacity (see Note)	
410	A	JCB 'Special' Hydraulic Fluid	100 litres	22 UK gals
	B	JCB High Performance Hydraulic Fluid		
412	A	JCB 'Special' Hydraulic Fluid	100 litres	22 UK gals
	B	JCB High Performance Hydraulic Fluid		
415	A	JCB 'Special' Hydraulic Fluid	113 litres	25 UK gals
	B	JCB High Performance Hydraulic Fluid		
420	A	JCB 'Special' Hydraulic Fluid	113 litres	25 UK gals
	B	JCB High Performance Hydraulic Fluid		
425	A	JCB 'Special' Hydraulic Fluid	155 litres	34.1 UK gals
	B	JCB High Performance Hydraulic Fluid		
430	A	JCB 'Special' Hydraulic Fluid	128 litres	28 UK gals
	B	JCB High Performance Hydraulic Fluid		

A = up to 38 deg C (100 deg F) B = above 38 deg C (100 deg F)

+ These oils meet the following specifications: API CD
MIL- L-2104D
MIL- L- 46152

Note: Hydraulic capacities shown are approximate and depend on equipment specified.

ENGINE COOLANT

Model	Engine	Capacity	
410	4.98	18 litres	32 UK Pints
	4.236	23.5 litres	41 UK Pints
	1004 - 4HR	16.75 litres	29 UK Pints
412/415	T4.236	26.5 litres	46 UK Pints
	1004 - 4THR	23.5 litres	42 UK Pints
420	6.3544	28 litres	50 UK Pints
425	1006-6HR	26.5 litres	47 UK Pints
430	T6.3544	28 litres	50 UK Pints

LUBRICANTS and CAPACITIES

Item	Model	Lubricant	Capacity	
Front Axle	**410/412/415**	JCB 'Special' Gear Oil	29.5 litres	6.5 UK galls
	†† **410/412**	JCB 'Special' Gear Oil	25.0 litres	5.5 UK galls
	420/425/430	JCB 'Special' Gear Oil	31.2 litres	6.9 UK galls
Rear Axle	**410/412/415**	JCB 'Special' Gear Oil	29.5 litres	6.5 UK galls
	†† **410/412**	JCB 'Special' Gear Oil	25.0 litres	5.5 UK galls
	420/425/430	JCB 'Special' Gear Oil	31.2 litres	6.9 UK galls
Braking System	all models	JCB Light Hydraulic Fluid		
Grease Points	all models	† JCB 'Special' MPL Moly Grease		
Fuel	**410/412/415**		95 litres	21 UK galls
*	**412 machines from 526177**		§ 140 litres	31 UK Galls
	420		181 litres	40 UK galls
	425		149 litres	33 UK galls
	430		185 litres	40 UK galls

† denotes Multi-purpose Lithium grease with Molybdenum di-sulphide

†† denotes **410** and **412** machines built after September 1989

* § denotes 45 litre (10 UK galls) auxiliary fuel tank fitted.

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.	Bolt Size (mm)	Hexagon (A/F) in.	Torque Settings Nm.	Torque Settings kgf m	Torque Settings 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 (mm)	Hexagon (A/F) mm	Torque Settings Nm.	Torque Settings kgf m	Torque Settings 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

*ZF Transmission (use only on ZF Transmission) — in Nm

Metric Coarse Thread

Size	Grade 6.9	8.8	10.9	12.9
M6	8.5	10	14	17
M8	21	25	35	41
M10	41	49	69	83
M12	72	86	120	145
M14	115	135	190	230
M16	180	210	295	355
M18	245	290	400	485
M20	345	419	580	690
M22	465	550	780	930
M24	600	710	1000	1200
M27	890	1050	1500	1800
M30	1200	1450	2000	2400

Metric Fine Thread

Size	Grade 6.9	8.8	10.9	12.9
M8 x 1	23	27	38	45
M10 x 1,25	44	52	73	88
M12 x 1,25	80	95	135	160
M12 x 1,5	76	90	125	150
M14 x 1,5	125	150	210	250
M16 x 1,5	190	225	315	380
M18 x 1,5	275	325	460	550
M20 x 1,5	385	460	640	770
M22 x 1,5	520	610	860	1050
M24 x 2	650	780	1100	1300
M27 x 2	970	1150	1600	1950
M30 x 2	1350	1600	2250	2700

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

SERVICE SCHEDULES

EVERY 10 OPERATING HOURS OR DAILY whichever occurs first

CLEAN

Machine generally
Engine air filter pre-cleaner

CHECK (engine stopped)

Generally for damage
* Engine Coolant level and condition
Engine oil level and condition
Hydraulic fluid level
Tyre pressures and condition
Tightness of wheel nuts
* Parking brake operation
* Service brake operation
Windscreen washer level
* All pivot pin grease seals
* Air cleaner hose security
* Seat belt condition and security (when fitted)

CHECK (engine running)

Operation of all services
* Hydraulic system for leaks
* Transmission oil level
Operation of all electrical equipment
Exhaust (excessive smoke)
* Fuel system for leaks
* Engine generally for leaks
* Instrument readings, warning lights and audible alarm

* **DRAIN**

Fuel Filter

GREASE

* Bucket pivot pins (415 & 425)
* Hydraulic Tow Hitch (410 & 412) (if fitted)

EVERY 50 OPERATING HOURS OR WEEKLY whichever occurs first

Do the daily jobs plus:

CHECK (engine stopped)

Fan belt/tension
* Air conditioner compressor belt tension (if fitted)
Radiator and hose condition
* Electrolyte level
Axle oil level
* Brake fluid level
* Condition of ram piston rod
* Hoses and pipework for chafing/security

CLEAN

* Fuel sediment bowl

GREASE

* Bucket pivot pins (410 & 412 from m/c No. 524349)
* Loader arm pivot pins (415 & 425)
Lower centre pivot
Steer ram pins

* **CHANGE**

Transmission oil filter (First 50 hours only)

* ***Note:*** *Initial transmission oil filter change at 50 hours and 100 hours on new and rebuilt transmissions.*

* **OIL**

All linkages, hinges and cables

SERVICE SCHEDULES (cont'd)

INITIAL 100 HOURS SERVICE (new machines only)

Do the Daily to 50 hour jobs plus:

CLEAN

Fuel lift pump
Heater filter

CHECK (engine stopped)

Condition of ram piston rods
All pivot pin grease seals
Hoses and pipework for chafing/damage
Fuel system for leaks/contamination
Exhaust system security
Cylinder head torque settings (4 cyl. only; LJ builds up to Eng. No. UO27773M)
Valve clearances
Engine mountings
Air cleaner hose security
Wiring harness for chafing
Rear axle pivot end float

CHECK (engine running)

MRV pressure
ARV pressure
Steering relief pressure
Idling speed
Maximum governed speed
Pulled down speed
Operation of clutch cut-off

CHANGE

Engine oil
Engine oil filter element
Fuel filter element
Hydraulic filter element
Transmission filter element

GREASE

* Loader pivot pins (410 & 412 from m/c No. 524349)

EVERY 100 OPERATING HOURS OR MONTHLY whichever occurs first

Do the Daily to 50 hour jobs plus:

GREASE

* Loader pivot pins (410 & 412 from m/c No. 524349)

* **CHANGE**

Transmission oil filter (First 100 Hours only)

* ***Note:*** *Initial transmission oil filter change at 50 hours and 100 hours on new and rebuilt transmissions.*

EVERY 250 OPERATING HOURS OR MONTHLY whichever occurs first
Do the Daily to 100 hour jobs plus;

* **CLEAN**

Air filter dust valve

CHECK (engine stopped)

Exhauster oil level (412 and 415 only)
* Battery electrolyte level and condition

* **CHECK (engine running)**

Air conditioner filter/drier sight glass for fluid (with air conditioner system running). (if fitted).

CHANGE

Engine oil
Engine oil filter element
Fuel filter element

* **GREASE**

Intermediate propshaft (425)
Front propshaft (410,412 and 415)

SERVICE SCHEDULES (cont'd)

EVERY 500 OPERATING HOURS OR THREE MONTHS whichever occurs first
Do the Daily to 250 hour jobs plus:

CLEAN

Battery terminals
* Fuel lift pump gauze
Engine injectors and test (4.98)
* Transmission oil strainer
* Cab heater air filter (weekly in very dusty conditions)

CHECK (engine stopped)

Exhaust system security
Engine mountings
Parking brake adjustment

CHECK (engine running)

MRV pressure
ARV pressure
Steering relief pressure
Idling speed
* Maximum no load speed
Pulled down speed
Operation of clutch cut-off
* Converter oil pressure
* Clutch oil pressure
* Servo pressure

CHANGE

Hydraulic filter element
Transmission oil filter
* Axle oil (When operation in regions where ambient temperature exceeds 32°C (90•F)

GREASE

Upper centre pivot (later machines)
* Rear propshaft (410 & 412)

EVERY 1000 OPERATING HOURS OR SIX MONTHS whichever occurs first
Do the Daily to 500 hour jobs plus;

CLEAN

Air cleaner dust valve

CHECK

Engine compression
Valve clearances (4.98)
* ROPS/FOPS structure

CHANGE

Outer air cleaner element
Brake system fluid
Axle oil
* Transmission oil

*** GREASE**

Rear propshaft (415 & 425)
Front propshaft (425)

EVERY 2000 OPERATING HOURS OR YEARLY whichever occurs first

CHANGE

Inner air cleaner element
* Hydraulic fluid (clean suction strainer)
* Engine coolant, clean system

*** CLEAN**

Engine injectors and test (4.236, 6.354, 1004, 1006)
Hydraulic suction strainer
Emergency steer pump strainer (if fitted)

*** CHECK (engine stopped)**

Valve Clearances (4.236, 6.354, 1004, 1006)

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GREASING

Loader Arms *for interval see Service Schedule*

Note: **ALWAYS** grease with loader arms fully down, never with arms raised.

⚠ WARNING

Make sure the articulation lock is fitted before greasing the centre pivot.

* GEN-3-3

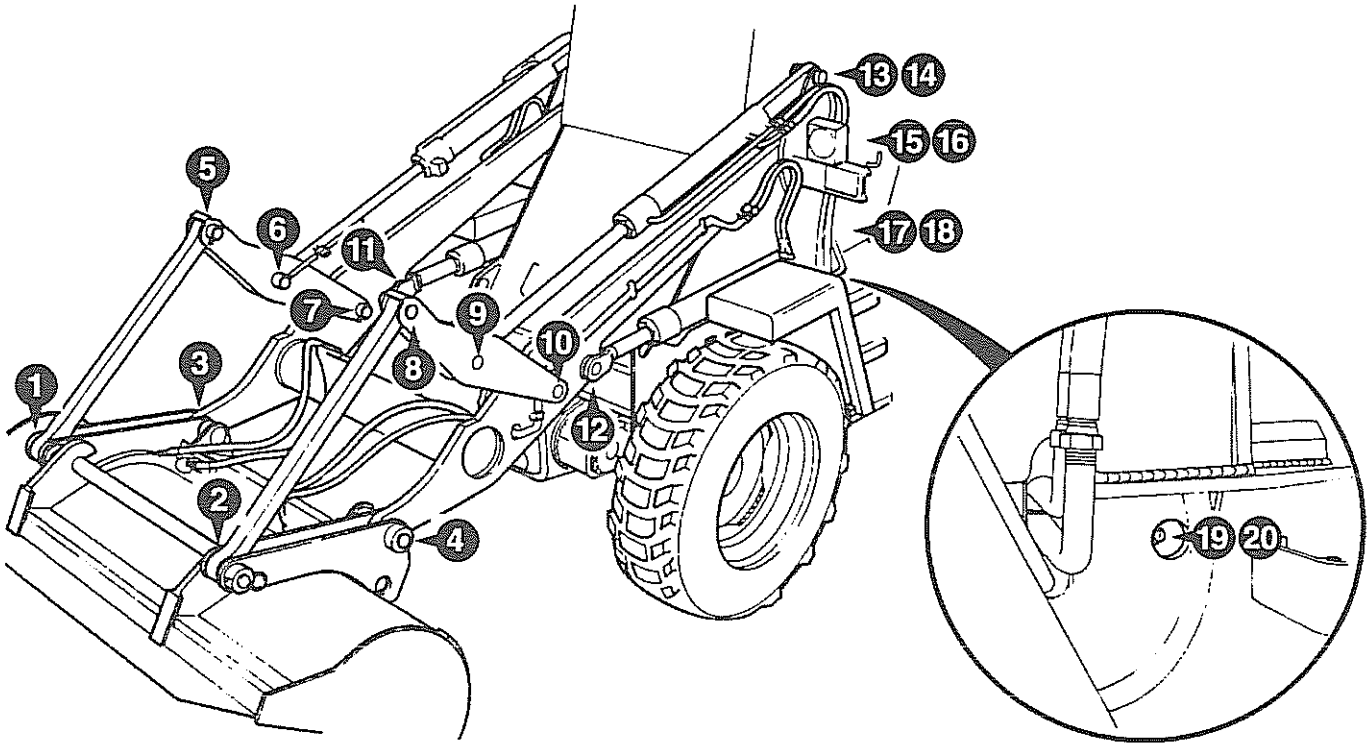
Centre Pivot (upper and lower) *for interval see Service Schedule*

⚠ WARNING

Make sure the articulation lock is fitted before greasing the steer ram pins.

* GEN-3-4

Steer Ram Pins *for interval see Service Schedule*



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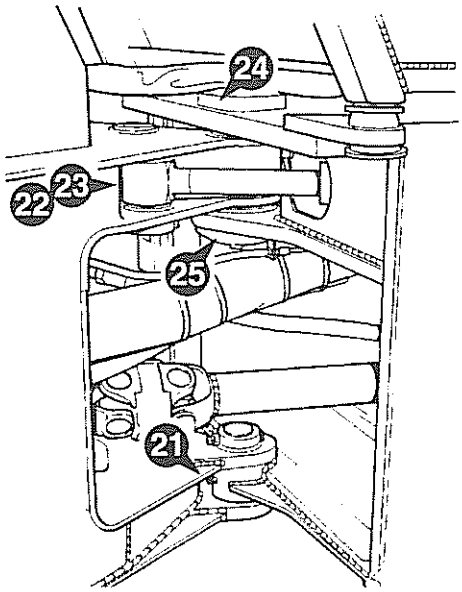

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GREASING

Propshafts *for interval see Service Schedule*

⚠ WARNING

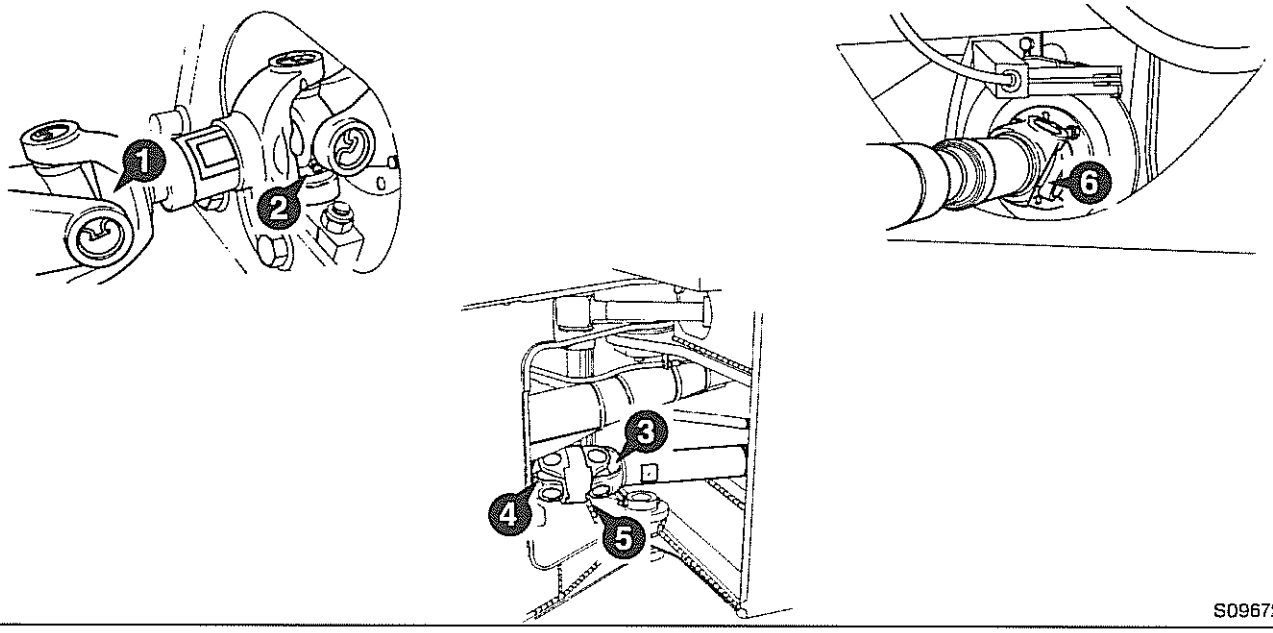
Make the machine safe before working underneath it. Park the machine on level ground, lower the arms. Apply the parking brake, put the transmission in neutral and stop the engine. Chock both sides of all four wheels.

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

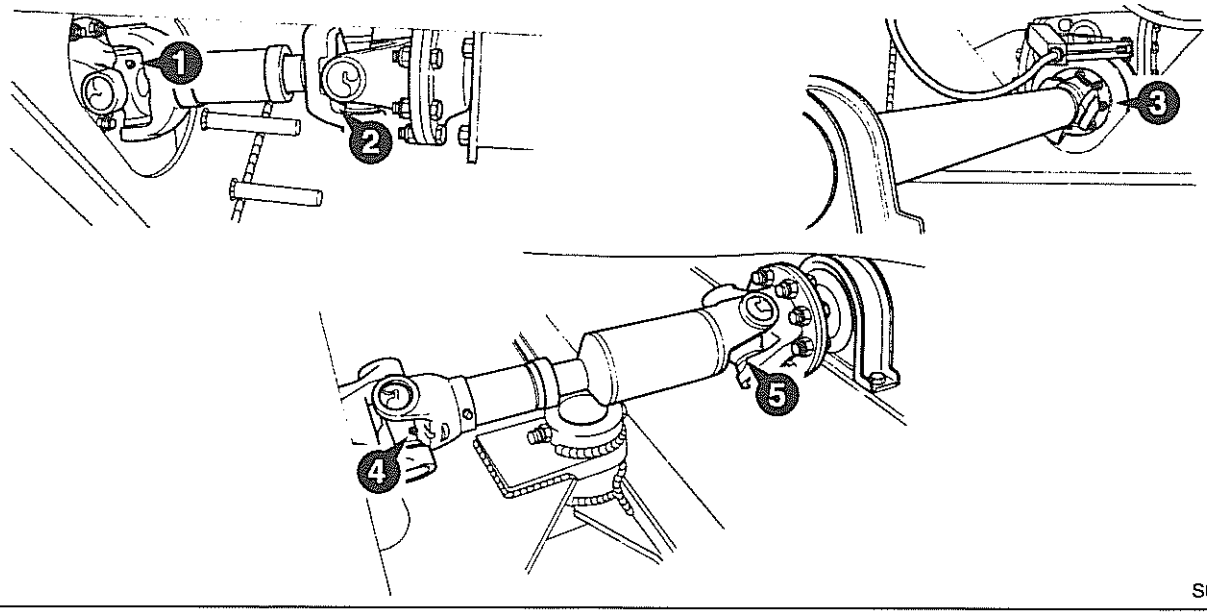
GEN-1-2

Apply 3 shots of grease to the universal joints.

410, 412 and 415



425



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* TECHNICAL DATA - 410 and 412 up to m/c No. 524348

Pump

Type	Hamworthy PC1909B2 B2C
Flow at 2200 rev/min and 206 bar (3000 lbf/in^2)	86.4 litres/min (19 UK gal/min)

Note: This flow is directed, on demand, to the steering system by means of a priority valve.

Loader Valve

Type	
- 2 Spool with spring-centred regenerative shovel spool and float on lift arms:	VDP22RF
- 2 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms:	VDP22RF
- 3 Spool, as 2 Spool with detents but with additional spring-centred third spool for clam shovel:	VDP22RFD
Services Operated	
- Spool 1	Shovel
- Spool 2	Lift Arms
- Spool 3	Clam

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	206	210	3000
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	172	176	2500
Shovel Ram Rod Side	238	243	3452

Filter			
By-pass pressure (early models)	1	1.05	15
(later models)	1.5	1.53	21.75

Rams	**Bore**		**Rod Dia**		**Stroke**	
	mm	in	mm	in	mm	in
Lift	100	3.94	60	2.36	630	24.8
Shovel	80	3.15	50	1.97	638	25.2
Tow Hitch	60	2.36	30	1.18	216	8.5
Quickhitch	50	1.97	25	0.98	247	9.7

***TECHNICAL DATA - 410 and 412 from m/c No.524349**

Pump

Type	Hamworthy PC1909B2B45C
Flow at 2200 rev/min and 206 bar (3000 lbf/in^2)	88 litres/min (19 UK gal/min)

Note: This flow is directed, on demand, to the steering system by means of a priority valve.

Loader Valve

Type	
- 3 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms:	MVCPO1034RFD8V
- 3 Spool (motor spool) with electric detent on all spools and arms float:	MVCPO1034RFD7V
- 4 Spool. As 3 spool but with additional spring-centred 4th spool:	SP1,1,MC,SEDX/P,DX,A1,DX/EP,NA,S,OR,ST.

Services Operated	
- Spool 1	Shovel
- Spool 2	Lift Arm
- Spool 3	Optional
- Spool 4	Optional

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	207	210	3000
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	172	176	2500
Shovel Ram Rod Side	241	245	3494

Filter			
By-pass pressure	1.5	1.53	21.75

* TECHNICAL DATA - 415

Pump

*** Type**	Hamworthy PC2207S2C1 B26C
Flow at 2200 rev/min and 206 bar (3000 lbf/in^2)	108.6 litres/min (24 UK gal/min)

Note: This flow is directed, on demand, to the steering system by means of a priority valve.

Loader Valve

Type

- 2 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms:	VDP22RF
- 3 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms:	VDP22RFD
- 4 Spool, as 3 Spool but with additional spring-centred fourth spool:	VDP22RFDD

Services Operated

- Spool 1	Shovel
- Spool 2	Lift Arm
- Spool 3	Optional
- Spool 4	Optional

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	206	210	3000
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	172	176	2500
Shovel Ram Rod Side	238	243	3452

Filter			
By-pass pressure (early models)	1.0	1.0	15
(later models)	1.5	1.53	21.75

Rams	**Bore**		**Rod Dia**		**Stroke**	
	mm	in	mm	in	mm	in
Lift	100	3.94	60	2.36	693	27.3
Shovel	90	3.54	50	1.97	638	25.2
Tow Hitch	60	2.36	30	1.18	216	8.5

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TECHNICAL DATA - 420

Pump

Type Hamworthy PC2210S2 B26C
Flow at 2200 rev/min and 186 bar (2700 lbf/in^2) 136.4 litres/min (30 UK gal/min)

Note: The flow is directed, on demand, to the steering system by means of a priority valve.

Loader Valve

Type
- 2 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms: VDP23RF
- 3 Spool, as 2 Spool but with additional spring-centred third spool for clam shovel: VDP23RFD
- 4 Spool, as 3 Spool but with additional spring-centred fourth spool: VDP23RFDD

Services Operated
- Spool 1 Shovel
- Spool 2 Lift Arms
- Spool 3 Clam
- Spool 4 Optional

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	186	190	2700
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	152	155	2200
Shovel Ram Rod Side	220	224	3200

Filter			
By-pass pressure	1.0	1.05	15

Rams	**Bore**		**Rod Dia**		**Stroke**	
	mm	in	mm	in	mm	in
Lift	110	4.33	60	2.36	704	27.7
Shovel	100	3.94	60	2.36	638	25.2

TECHNICAL DATA - 425

Pump

Type	Hamworthy PCJT190909S2 H64 H39CL
Flow at 2200 rev/min and 186 bar (2700 lbf/in^2)	95.45 litres/min (20 UK gal/min) for each section Total 190.9 litres/min (40 UK gal/min)

Note: The flow from the front section is directed on demand to the steering system by means of a priority valve. The flow from the rear section is fed directly to the loader valve.

Loader Valve

Type	
- 3 Spool with electric detent on regenerative shovel spool, float and electric detent on lift arms with spring- centred third spool for clam shovel :	VDP24RFD
- 4 Spool, as 3 Spool but with additional spring- centred fourth spool:	VDP24RFDD
Services Operated	
- Spool 1	Shovel
- Spool 2	Lift Arms
- Spool 3	Clam
- Spool 4	Optional

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	186	190	2700
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	172	176	2500
Shovel Ram Rod Side	241	246	3500
* Lift Ram Head Side (see page 2/7-14)	296	302	4300
Filter			
By-pass pressure	1.5	1.53	21.75

Rams	**Bore**		**Rod Dia**		**Stroke**	
	mm	in	mm	in	mm	in
Lift	120	4.72	65	2.56	692	27.2
Shovel	110	4.33	60	2.36	638	25.2

TECHNICAL DATA - 430

Pump

Type	Hamworthy PC2213C4 B26C
Flow at 2200 rev/min and 206 bar (3000 lbf/in^2)	190.9 litres/min (42 UK gal/min)

Note: This flow is directed, on demand, to the steering system by means of a priority valve.

Loader Valve

Type	
- 2 Spool with electric detent on regenerative shovel spool, *float and electric detent on lift arms:	VDP24RF
- 3 Spool, as 2 Spool but with additional spring-centred third spool for clam shovel:	VDP24RFD
- 4 Spool, as 3 Spool but with additional spring-centred fourth spool:	VDP24RFDD
Services Operated	
- Spool 1	Shovel
- Spool 2	Lift Arms
- Spool 3	Clam
- Spool 4	Optional

Relief Valve Operating Pressures	**bar**	**kgf/cm^2**	**lbf/in^2**
- Main Relief Valve (M.R.V.)	206	211	27003000
- Auxiliary Relief Valves (A.R.V.)			
Shovel Ram Head Side	172	176	2500
Shovel Ram Rod Side	241	246	3500
Lift Ram Head Side (see page 2/7 - 4)	296	302	4300

Filter			
By-pass pressure	1	1.05	15

Rams	**Bore**		**Rod Dia**		**Stroke**	
	mm	in	mm	in	mm	in
Lift	120	4.72	65	2.56	692	27.2
Shovel	110	4.33	60	2.36	638	25.2

HYDRAULIC TANK AND SUCTION STRAINER

***Change Hydraulic Fluid and Clean Suction Strainer** *for interval see Service Schedule*

a Rest the bucket on the ground, stop engine and remove plug **A** to drain fluid.

b When the tank is empty, remove bolts **B** and plate **D** to gain access to strainer **E**.

c Unscrew bolt **F**, collecting nut **G** as the bolt is withdrawn.

d Remove and wash the strainer.

e Degrease bolt **F** and nut **G**. Screw in bolt about half its length using a new washer **H**.

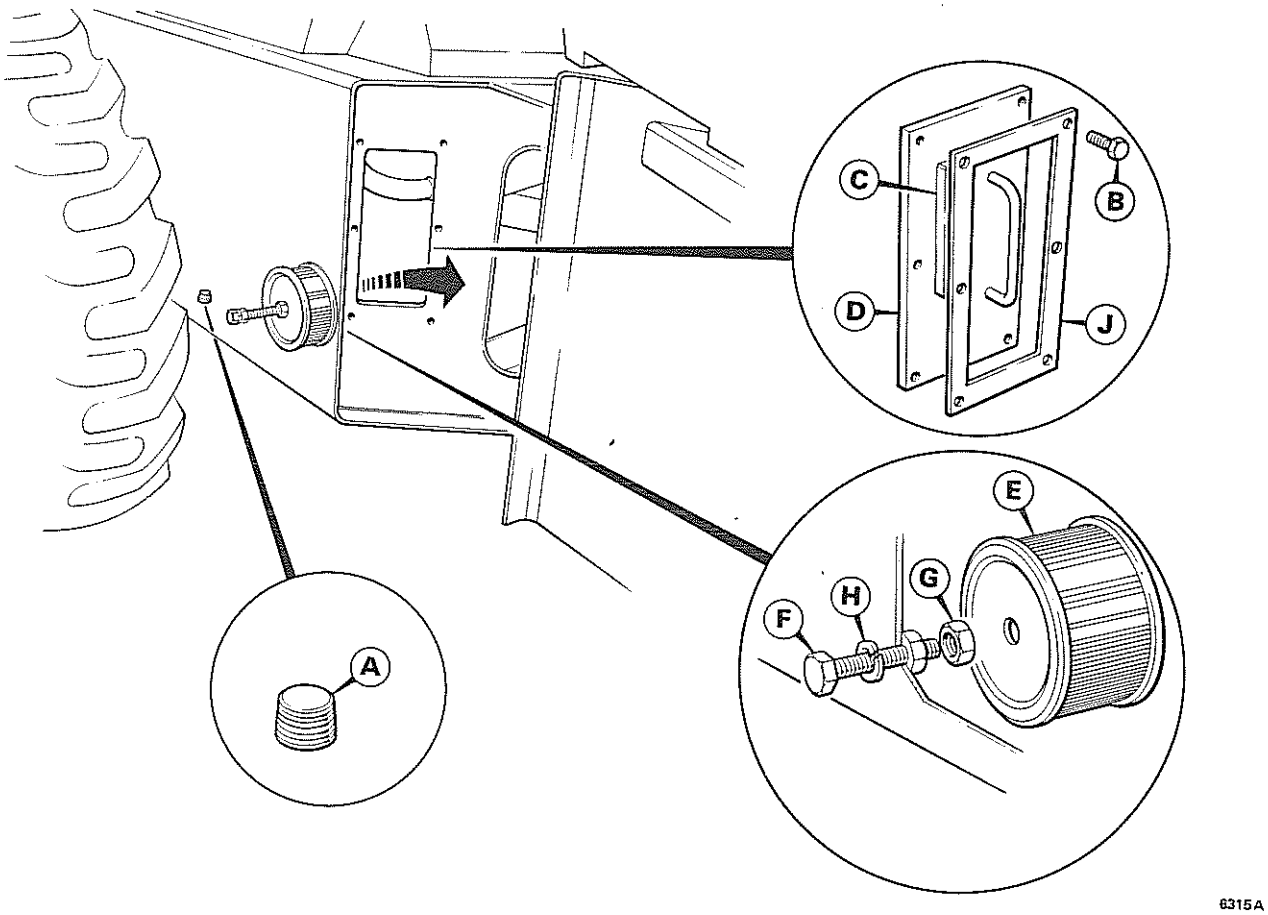
f Apply JCB Lock and Seal and thread nut onto bolt. Position strainer in tank and tighten bolt fully. Tighten nut until strainer is secured.

g Refit plate **D** using a new gasket **J**. Tighten bolts evenly to specified torque setting. Early machines have nuts instead of bolts.

h Refill tank with JCB 'Special' Hydraulic Fluid. Check level at **C**.

Torque Settings

Item	Nm	Kgf m	lbf ft
B	20	2.0	15



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