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Service Manual

Attachments

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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 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 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 numbered sections each concerning one specific attachment. Each numbered section other than the Introduction is broken down into the following.

General Information - includes service tools and specific information on each attachment.
Routine Maintenance - includes service schedules and recommended lubricants.
Servicing - includes dismantling, overhaul etc. of specific components.

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

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

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

SAFETY - YOURS AND OTHER PEOPLES

All mechanical equipment can be hazardous if operated without care or correct maintenance.

In this manual you will find warning messages. Read them. Understand them. They tell you of hazards and how to avoid them. If you do not understand the messages, ask your employer or local JCB Distributor.

But safety is not just a matter of responding to the warnings. All the time you are working with the attachment you must be thinking what hazards there might be and how to avoid them.

Do not work with the attachment 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 attachment or the job, ask someone who knows. Don't assume anything – check it out.

Remember

BE CAREFUL
BE ALERT
BE SAFE

Now read the rest of this section before moving on to the rest of the manual.
B-1-1-2/1

Note: Always put safety first. Obey all the safety instructions given in the Operator Handbook for your machine, plus those given in this manual.

GENERAL SAFETY

⚠ WARNING

You or others can be injured if you operate or maintain any attachments without first studying the machine Operator Handbook and the attachment Operator Handbook. Read the safety instructions before operating or maintaining the attachment. Do not operate or maintain the attachment without the relevant manuals or if there is anything you do not understand.
ATT-1-1

Operating Safety

⚠ CAUTION

Obey all laws, worksite and local regulations which affect you and your equipment.
A-1-3-6

⚠ DANGER

Lightning

Lightning can kill you. Do not use the equipment if there is lightning in your area.
A-1-3-5

⚠ WARNING

Keep people clear of the area when using the attachment to prevent possible injury.
B-2-2-4

⚠ WARNING

Hydraulic fluid at pressure can injure you. Make the machine safe before removing the hose blanking plugs or connecting/disconnecting the hoses; stop the engine and then operate the attachment control a few times to vent system pressure.
2-4-1-5/1

⚠ WARNING

Care and Alertness

All the time you are working with the attachment, take care and stay alert. Always be careful. Always be alert for hazards.
B-1-1-4/1

⚠ 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

⚠ WARNING

Clothing

You can be injured if you do not wear 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

Equipment Condition

Defective equipment can injure you or others. Do not operate equipment which is defective or has missing parts.

Make sure the maintenance procedures in this manual are completed before using the equipment.
A-1-4-1

⚠ CAUTION

Equipment Limits

Operating the equipment beyond its design limits can cause damage. It can also be dangerous.

Do not operate the equipment outside its limits.

Do not try to upgrade the equipment's performance by unapproved modifications.
A-1-4-2

⚠ WARNING

Communications

Bad communication can cause accidents.

Keep people around informed of what you will be doing. If you will be working with other people make sure you all understand any hand signals you will be using.

Work sites can be noisy. Do not rely on spoken commands.
A-1-4-3

Maintenance Safety

⚠ WARNING

Repairs and Maintenance

Do not try to do repairs or any other maintenance work you do not understand.

B-1-3-1

⚠ 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

⚠ CAUTION

Metal Splinters

You can be injured by flying splinters when driving metal pins in and out. Use a soft-faced hammer or drift to remove and fit metal pins, such as pivot pins. Always wear safety glasses.

INT-3-1-3

⚠ WARNING

Hydraulic fluid at pressure can injure you. Make the machine safe before connecting/disconnecting the hoses. To do this stop the engine and then, with the starter switch 'ON', operate the carrier auxiliary circuit controls a few times to vent system pressure.

B-1-3-5

⚠ WARNING

Maintenance

Never attempt to carry out maintenance work until the carrier engine is stopped, the starter key removed, and the attachment supported securely.

B-1-1-6

⚠ WARNING

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

Travelling with the Attachment

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.
5-2-5-9

Note: Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.

Make sure that the transporting vehicle is suitable. See ***Static Dimensions*** *(SPECIFICATIONS section of the* ***Machine Operator Manual****)* for the dimensions of your machine.

⚠ WARNING

Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tyres. Make sure the machine will not foul on the ramp angle. See Static Dimensions in SPECIFICATIONS section for the minimum ground clearance of your machine
2-2-7-5/1

On Site

Raise the carrier loader arm so that the attachment is approximately 200 mm (8 in) above the ground. When moving around the site follow as level a route as possible.

⚠ WARNING

Never travel at excessive speed over rough terrain. The resulting loss of control could cause the carrier to tip over. This could lead to death or serious personal injury as well as damage to the attachment and/or carrier.
B-1-2-11

On a Truck

⚠ WARNING

Water, mud, ice, grease and oil on ramps 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. Always reverse down a ramp if loaded, travel forwards if unloaded.
3-1-1-3

1 Drive the carrier up the ramps and onto the truck after proceeding as described for **On Site**.

a If the attachment is being transported alone, lower the assembly to the floor of the truck. Remove from the machine *(see* ***Removing - Attachment Owners Manual****)* and drive the carrier off the truck. Secure the attachment to the truck using straps or chain of sufficient strength.

b If the attachment is being transported with the machine, lower the assembly to the floor of the truck and switch off the engine. Block the wheels and using the attachment points chain the carrier to the bed of the truck as shown in the illustration in the ***Attachments Owners Manual.***

Quick Release Couplings

Flat face quick release couplings allow the operator to remove and install attachments swiftly and efficiently. Generally, your machine pipework will have female couplings **A** fitted, and the optional attachment hoses will have male couplings **B** fitted.

The quick release couplings should be trouble free and relatively easy to connect and disconnect, provided they are kept clean and used correctly. The recommendations listed below should always apply when using flat face quick release couplings.

Finally, please read the correct fitting and releasing procedures before installing or removing any optional attachment fitted with quick release couplings.

Quick Release Couplings - Do's & Don'ts

DO wipe the two faces of the coupling and make sure they are clean before connecting.

DO make sure the outside sleeve (female coupling) is pulled back when disconnecting.

DO connect and disconnect a new coupling two or three times to 'work' the PTFE seals - sometimes a new coupling will stick if the seals have not been 'worked'.

DO use a spanner on the hexagon flats of the coupling when fitting adaptors.

DO use a rubber or hide hammer to disconnect a coupling if it sticks - sticking may occur if there is dirt present in the coupling.

DON'T attempt to re-connect a damaged half coupling - this will destroy the seals and necessitate replacing both half couplings.

DON'T leave the coupling where it may be run over by a machine or otherwise crushed - this will distort the coupling sleeve and prevent correct connection and disconnection.

DON'T clamp on the smooth diameter of the coupling when fitting adaptors - always use the hexagon.

DON'T try to turn the sleeve (female coupling) when the coupling has been disconnected - the locking ball will wedge underneath the sleeve and destroy the coupling.

DON'T damage the faces of the couplings - this can prevent connection and disconnection, or damage seals and cause leakage.

DON'T try to dismantle the couplings - they are non serviceable parts. If a coupling is damaged it should be replaced with a new one.

⚠ WARNING

Hydraulic fluid at pressure can injure you. Make the machine safe before connecting or disconnecting quick release couplings; stop the engine and then operate the attachment control a few times to vent residual hydraulic pressure in the attachment hoses.

2-4-1-11

⚠ WARNING

The external surfaces of the couplings must be clean before connecting or disconnecting. Ingress of dirt will cause fluid leaks and difficulty in connecting or disconnecting. You could be killed of seriously injured by faulty Quick Release Couplings.

2-4-1-15

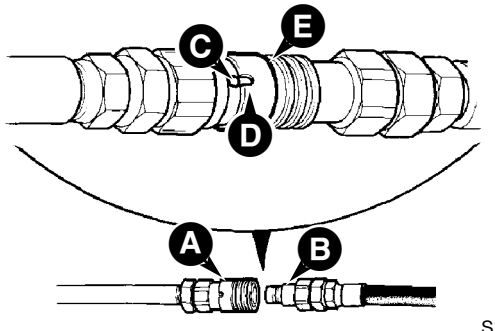
Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. This is usually achieved by switching off the engine and then operating the attachment control lever several times. Make sure the hose service line has been vented before connecting or removing hoses.

Connecting Quick Release Couplings

1. Remove any residual hydraulic pressure trapped in the service line hose.
2. Wipe the two faces of the male and female couplings and make sure they are clean.
3. Make sure that ball **C** in the female coupling is located in one of its slots.
4. Fit the male coupling into the female coupling; To ensure that the coupling is not accidentally released, rotate sleeve **E** a quarter turn and make sure that the locking ball **C** does not align with the slot **D**.

Disconnecting Quick Release Couplings

1. Remove any residual hydraulic pressure trapped in the service line hose.
2. Align the slot **D** with ball **C**.
3. Pull back sleeve **E** to release the coupling.



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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.

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.

4 Avoid skin contact with oil soaked clothing.

5 Don't keep oily rags in pockets.

6 Wash dirty clothing before re-use.

7 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 extinguishers. **Do not use water**. Fire-fighters should use self-contained breathing apparatus.

Construction machinery uses a large volume of fluid in the hydraulic system for power transmission, equipment lubrication, rust prevention and sealing.

According to a survey conducted by a pump manufacturer, seventy per cent of the causes of problems in hydraulic equipment were attributed to inadequate maintenance of the quality of the hydraulic fluid.

Therefore, it is obvious that control of the quality of the hydraulic fluid helps prevent hydraulic equipment problems and greatly improves safety and reliability. It also extends the life of the hydraulic fluid.

Effects of Contamination

Hydraulic circuit contaminants greatly reduce the performance and life of hydraulic equipment. For example, contaminants in a hydraulic pump develop internal wear to cause internal leakage and hence lower discharges. Wear particles generated will circulate with the hydraulic fluid to cause further deterioration in the performance of this and other equipment.

Contaminants also enter principal sliding sections of the equipment; causing temporary malfunction, scuffing, sticking and leakage and can lead to major problems.

The main contaminants can be classified as follows:-

1 **Solid Particles** - sand, fibres, metallic particles, welding scale, sealing materials and wear particles etc.

2 **Liquid** - usually water and incompatible oils and greases.

3 **Gases** - Air, sulphur dioxide etc. which can create corrosive compounds if dissolved in the fluid.

These contaminants can appear during manufacture, assembly and operation.

Cleaning Operation

The purpose of cleaning oil is to remove contaminants of all types and sludge by filtering hydraulic fluid through a cleaning unit as illustrated or similar.

Procedure

Connect the cleaning unit in place of the hydraulic filter and run the system for sufficient time to pump all the hydraulic fluid through the unit. Disconnect the cleaning unit and reconnect the filter. Top up the system with clean hydraulic fluid as required.

Contaminant Standards

Dirt that damages your system is in many cases too small to be seen with the eye. The particle size is measured in microns.

1 micron = 0.001 mm (0.0000394 in)

Listed below are a few typical comparisons:-

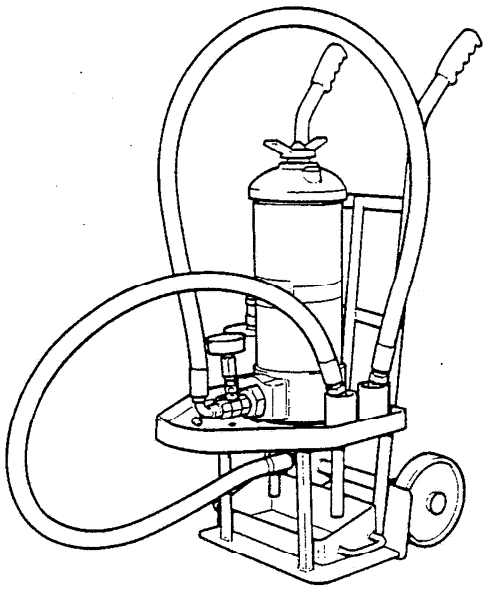
Red blood cell = 8 microns (0.008 mm, 0.00315 in)
Human hair = 70 microns (0.07 mm, 0.00275 in)
Grain of salt = 100 microns (0.1 mm, 0.00394 in)

Smallest particle visible to the naked eye is 40 microns (0.00157) approximately.

Standards will often be quoted to ISO (Internal Standards Organisation) for which literature can be obtained.

Filters

The filter assembly fitted to all product ranges is designed to filter all the contamination that is generated through use to the required level of cleanliness. It must be serviced to the requirements of the Service Schedules (See ***Service Schedules***).



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Hydraulic Oils, Filtering and Cooling

Introduction

Generally speaking the hydraulic oil specified for the carrier can be used in the attachment. However, since working with the attachment will heat the oil much more than excavation work, the viscosity of the oil must be checked periodically when working in hot climates.

When the attachment is used continuously, the temperature of the hydraulic oil normalises at a certain level depending on conditions and the carrier. At this temperature, the viscosity of the hydraulic oil should be 20 - 40 cSt (2.90 - 5.35 °E).

The attachment must not be started if the viscosity of the hydraulic oil is above 1000 cSt (131 °E) or operated when the viscosity of the hydraulic oil is below 15 cSt (2.35 °E).

Possible Result of using incorrect Oil

Oil too thick:
- Difficult start up.
- Stiff operation.
- Motor runs slowly.
- Danger of cavitation in the pumps and motor.
- Sticky Valves.
- Filter bypass, impurities in oil not removed.

Oil too thin:
- Efficiency losses (internal leaks).
- Damage to gaskets and seals, leaks.
- Accelerated wearing of parts, because of decreased lubrication efficiency.

Note: We recommend different hydraulic oils for use in summer and winter if there is an average temperature difference of more than 35 °C (95 °F).

Special Oils

In some cases special oils (e.g. biological oils and non-inflammable oils) can be used with the attachment. Observe the following aspects when considering the use of special oils.

- The viscosity range in the special oil must be in the given range (15 - 1000 cSt).
- The lubrication properties must be good enough.
- The corrosion resistance properties must be good enough.

Note: Although a special oil could be suitable for the carrier, it may not be suitable for the attachment. Please check with your JCB Distributor.

JCB OWNERS SHOULD ALWAYS CONSULT THEIR JCB DISTRIBUTOR BEFORE CHANGING THE MACHINE HYDRAULIC OIL.

Hydraulic Oil Purity

No separate filter is required for the attachment. The carrier's oil filter will clean the oil flowing through the attachment. The purpose of the oil filter is to remove impurities from the hydraulic oil since they cause accelerated component wear, blockages and even seizure. Impurities also cause the oil to heat and deteriorate. Air and water are also impurities in oil. Not all impurities can be seen with the naked eye.

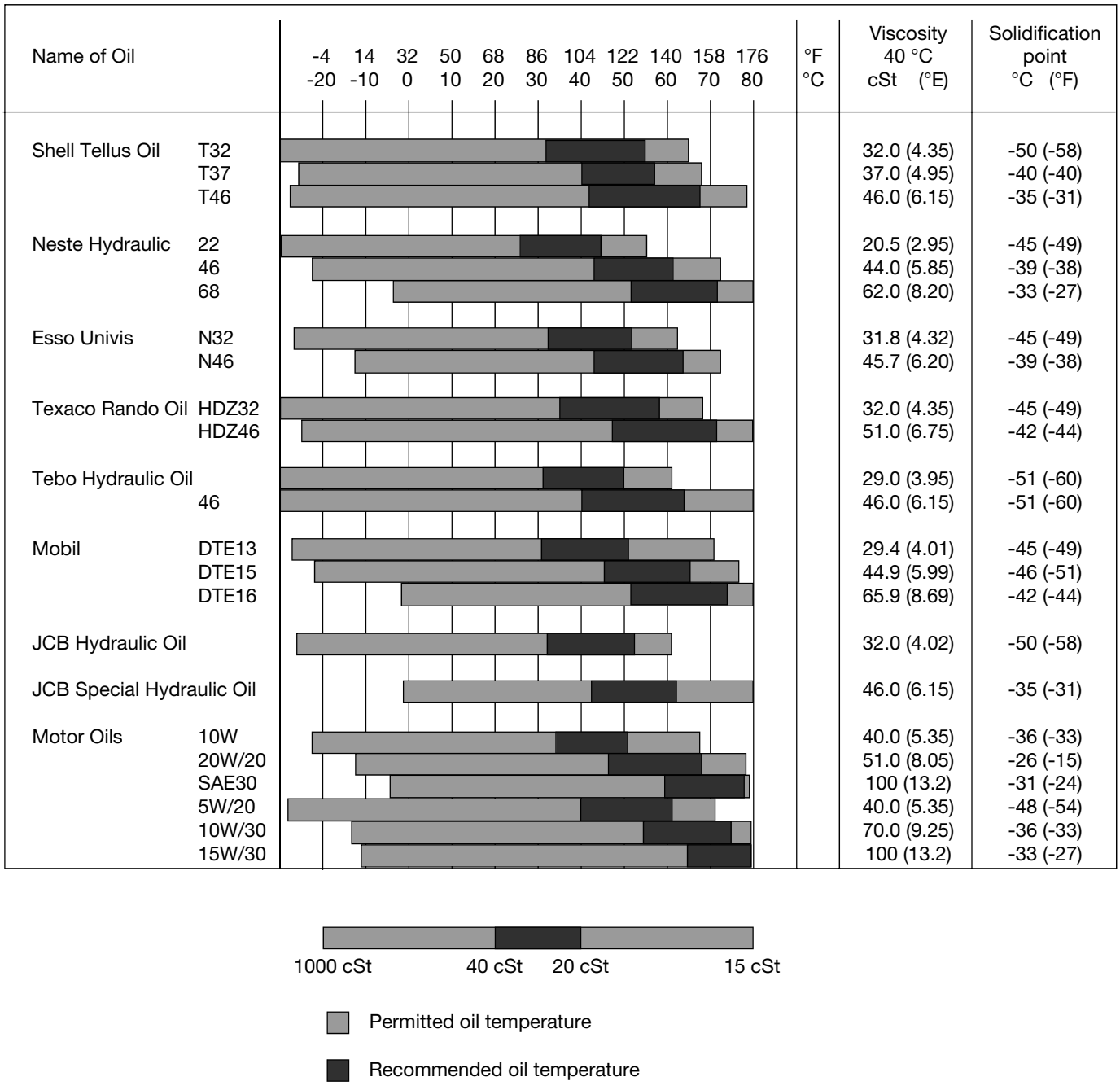
Impurities enter the hydraulic system:
- During hydraulic oil changes and refilling.
- When components are repaired or serviced.
- When the attachment is being installed on the carrier.
- Because of component wear.

Oil Filter

In hydraulic attachment work, the carrier oil filter must fulfil the following specifications:
- The oil filter must allow maximum particle size of 25 microns (0.025 mm).
- The oil filter material must be man-made fibre cloth or very fine gauge metallic mesh to withstand pressure fluctuations.
- The oil filter must have a volume flow capacity of at least twice the attachment's maximum flow.

In general, oil companies guarantee new oils to have a particle count of 40 microns maximum. When adding oil to the system the oil must be filtered.

Hydraulic Oils, Filtering and Cooling (cont'd)



Name of Oil		Viscosity 40 °C cSt (°E)	Solidification point °C (°F)
Shell Tellus Oil	T32	32.0 (4.35)	-50 (-58)
	T37	37.0 (4.95)	-40 (-40)
	T46	46.0 (6.15)	-35 (-31)
Neste Hydraulic	22	20.5 (2.95)	-45 (-49)
	46	44.0 (5.85)	-39 (-38)
	68	62.0 (8.20)	-33 (-27)
Esso Univis	N32	31.8 (4.32)	-45 (-49)
	N46	45.7 (6.20)	-39 (-38)
Texaco Rando Oil	HDZ32	32.0 (4.35)	-45 (-49)
	HDZ46	51.0 (6.75)	-42 (-44)
Tebo Hydraulic Oil		29.0 (3.95)	-51 (-60)
	46	46.0 (6.15)	-51 (-60)
Mobil	DTE13	29.4 (4.01)	-45 (-49)
	DTE15	44.9 (5.99)	-46 (-51)
	DTE16	65.9 (8.69)	-42 (-44)
JCB Hydraulic Oil		32.0 (4.02)	-50 (-58)
JCB Special Hydraulic Oil		46.0 (6.15)	-35 (-31)
Motor Oils	10W	40.0 (5.35)	-36 (-33)
	20W/20	51.0 (8.05)	-26 (-15)
	SAE30	100 (13.2)	-31 (-24)
	5W/20	40.0 (5.35)	-48 (-54)
	10W/30	70.0 (9.25)	-36 (-33)
	15W/30	100 (13.2)	-33 (-27)

Note: JCB approves the use of Q8 Holbein 46 Biodegradable Oil with this attachment. Its properties are comparable to JCB Special Hydraulic Oil.

Hydraulic Oils, Filtering and Cooling (cont'd)

Note: The following information is for guidance of non-JCB owners.

The maximum permitted hydraulic oil temperature in continuous attachment use is 50 - 80 °C (120 - 176 °F) depending on the viscosity of the oil in the system. Therefore, a reliable hydraulic oil thermometer is necessary. If there is no thermometer on the carrier one must be installed. The temperature of the hydraulic oil depends on ambient conditions, the cooling system efficiency of the carrier and on the capacity of the attachment. When the attachment is used continuously it may be necessary to have a cooling system with extra cooling capacity compared with normal excavation work.

The oil cooler of the carrier must have a volume flow capacity of at least twice the attachment's maximum volume flow.

The cooler must be suitable for a dynamic pressure of 20 bar (290 psi).

If the carrier's oil cooler is too small either the original cooler must be replaced with a larger one or an auxiliary cooler must be installed.

The auxiliary hydraulic cooler can be installed:

- In the front of the radiator, in which case a fan is not needed (maximum temperature rise of the cooling air is 5 °C, 9 °F).
- Any other suitable place, using a fan either hydraulically or electrically driven.

If the oil temperature is still too high in spite of the coolers, please contact your JCB Distributor.

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	(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

JCB Multigasket	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65 mm diameter.	4102/1212	
JCB High Strength Threadlocker	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	
JCB Retainer (High Strength)	For all retaining parts which are unlikely to be dismantled.	4101/0651	
JCB Threadlocker and Sealer	A high strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm diameter, and for hydraulic fittings up to 25 mm diameter.	4101/0252	
JCB Threadseal	A medium strength thread sealing compound.	4102/1951	
JCB Threadlocker and 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.

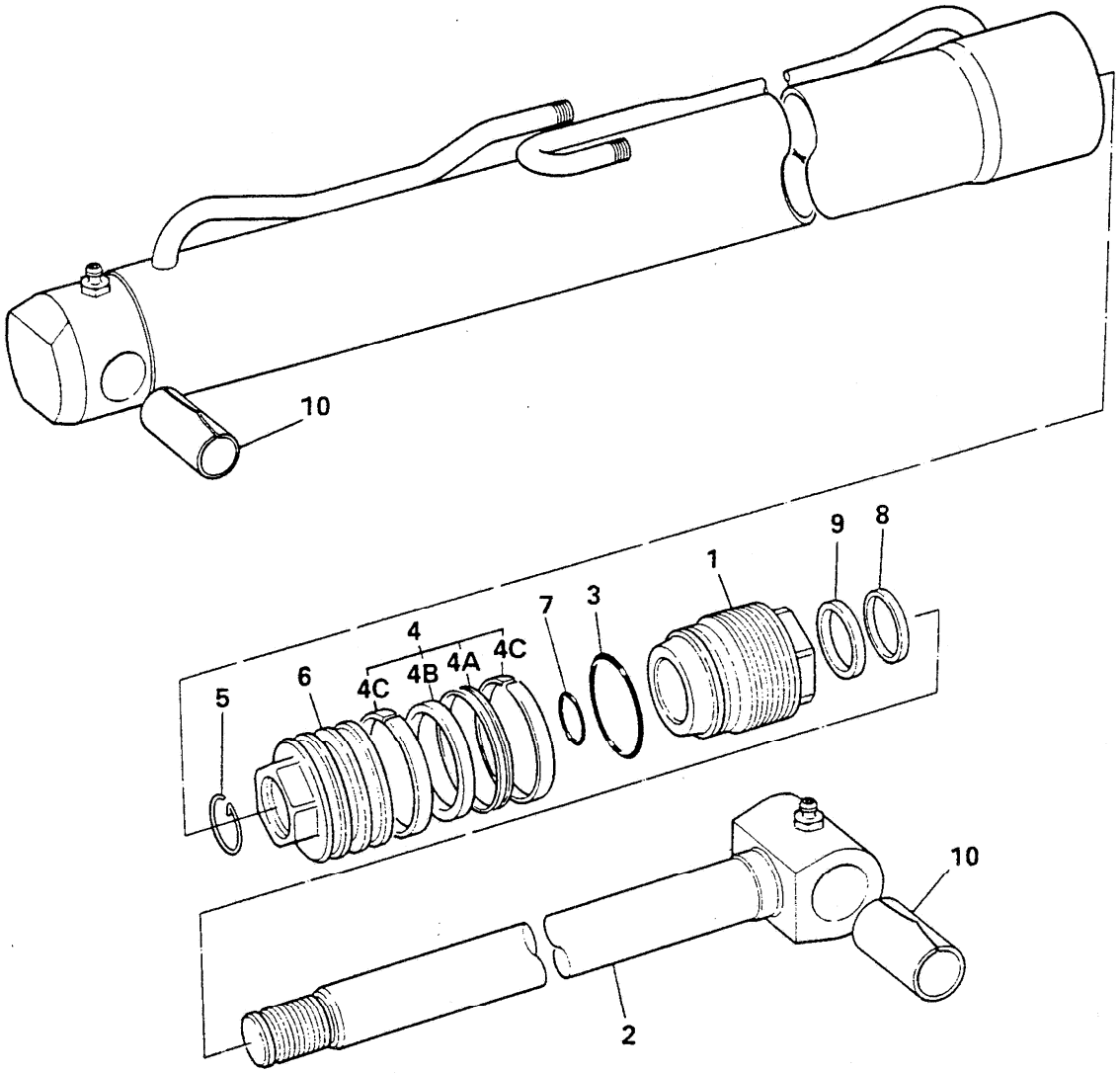
References to these products on subsequent pages in this service manual will be progressively updated, but for convenience a cross reference table is shown below.

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 577	4102/1901	**JCB Threadseal**	4102/1951
Loctite 518	4102/2002	**JCB Multigasket**	4102/1212
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
JCB Multigasket	4102/1201	**JCB Multigasket**	4102/1212
JCB Threadlocker	4101/0402	**JCB Threadlocker**	4101/0451
High Strength Lock and Seal	4104/0502	**JCB Threadlocker and Sealer (High Strength)**	4101/0552

Rams fitted to JCB attachments are either of JCB design and manufacture or one of two proprietary types. To avoid repeating information the following pages refer to typical rams, either JCB or Proprietary Type 1 or Proprietary Type 2.

Dismantling and assembly information for the three types of ram are given on this and the following pages.

JCB Typical Ram



JCB Typical Ram

Dismantling and Assembly

The numerical sequence shown on the illustration is intended as a guide to dismantling.

For assembly the sequence should be reversed.

When Dismantling

⚠ WARNING

If hydraulic pressure is used to force out the piston assembly ensure that the end cap is fitted securely. Severe injury can be caused by a rod being released suddenly.
HYD-1-3

When Assembling

* Thoroughly clean threads of piston head **6**, piston rod **2**, end cap **1** and cylinder with a wire brush. Ensure that all threads are free from grease, hydraulic oil and old sealing compounds using JCB Cleaner/Degreaser. Allow solvent to dry for 15 minutes before applying JCB Activator.

* Ensure that lubricants used during assembly do not come into contact with sealing compounds.

  When fitting seal **4A**, ensure internal seal **4B** remains seated squarely in its groove and is not twisted.

  Before fitting the end cap **1** onto the piston rod **2**, wrap tape around the piston rod threads to protect the gland seal from damage and the threads from oil and grease.

* Apply JCB Activator to the threads of the piston head **6**. Allow to dry for 15 minutes before bringing into contact with sealing compounds.

* **Note:** Sealing compounds and JCB Activator must not contact seals, bearing rings or 'O' rings.

* Apply JCB Threadlocker and Sealer (High Strength) to all threads of the piston rod. Fit and torque-tighten the piston head. Fit a new wire clip **5**. **Do not re-use the original wire clip**.

* Taking care to retain the end cap **1** at the further end of the piston rod from the cylinder, coat thread of cylinder with JCB Activator. Next apply JCB Threadlocker to thread of end cap. Wait 15 minutes before bringing the two together and then torque-tighten the end cap into the cylinder.

* **Note:** If hydraulic oil contacts uncured sealing compound, a weakening of the bond will result. Cure times vary according to the ambient temperature and type of Activator used. The following approximate cure times apply at 20 °C (68 °F) and are the minimum periods between assembly and filling the ram with oil.

* JCB Threadlocker or Threadlocker and
  Sealer (High Strength) with JCB Activator - 1 hour

Torque Settings

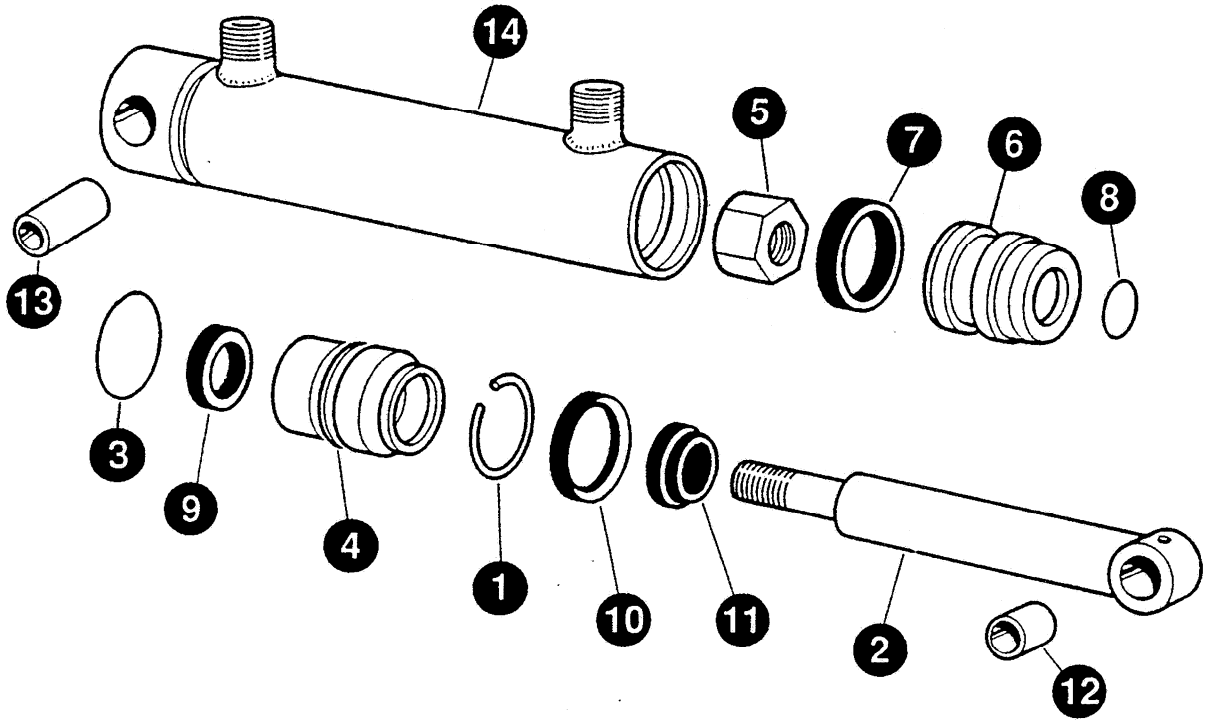
Item	Nm	kgf m	lbf ft
1	678	69	500
6	405	41	300

Note: When fitting cylinder and piston eye bushes **10**, ensure that the split in the bush is set at 90° to the longitudinal centreline of the cylinder.

Note: When operating in conditions which are consistently below freezing, it is recommended that the rams are operated slowly to their full extent before commencing normal working.

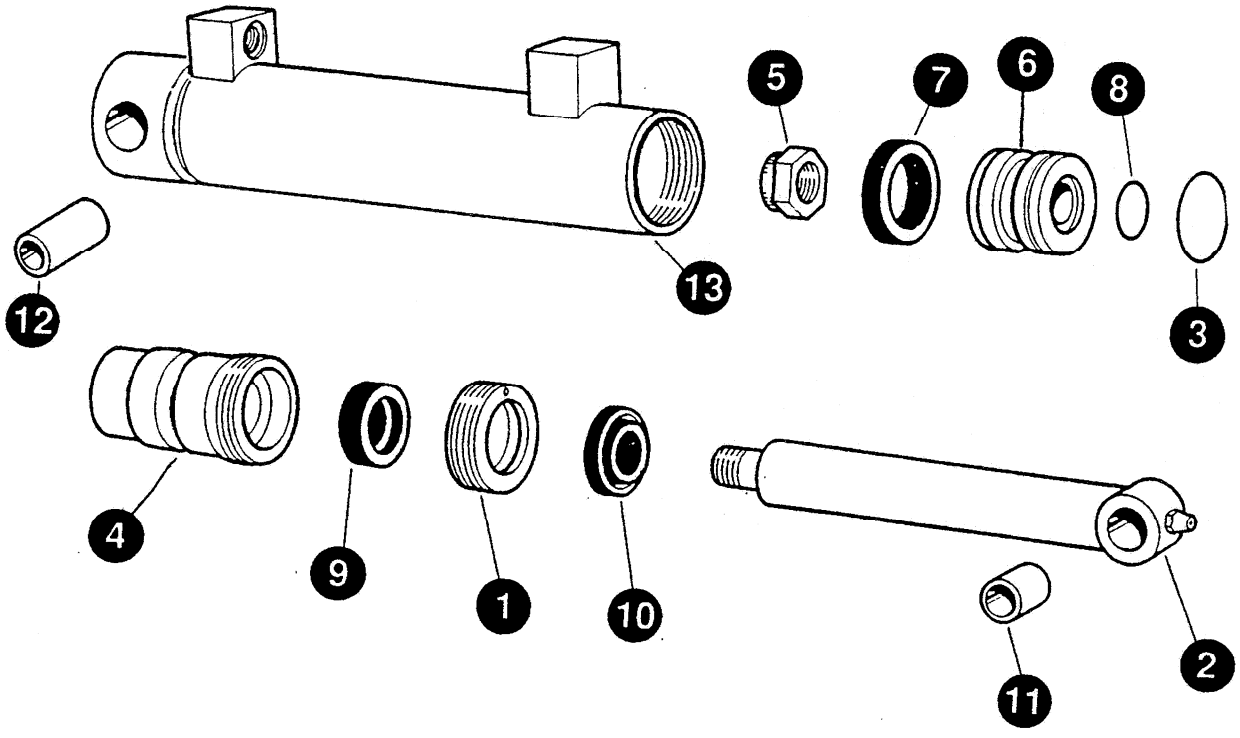
Proprietary Rams - Type 1

Dismantling and Assembly



Proprietary Rams - Type 2

Dismantling and Assembly



168050

Proprietary Rams

Note: There are basically two types of ram fitted to certain attachments (see **Notes** in relevant sections).

* **Type 1** - The seal carrier **4** is held into the ram body with a circlip **1**.

* **Type 2** - The seal carrier **4** is held into the ram body by a screwed ring **1**.

Dismantling and Assembly

The numerical sequence shown on the illustrations is intended as a guide to dismantling.

For assembly the sequence should be reversed.

When Dismantling

⚠ WARNING

If air or hydraulic pressure is used to force out the piston assembly ensure that the end cap is fitted securely. Severe injury can be caused by a rod being released suddenly.
HYD-1-3

When Assembling

* Use all new seals and 'O' rings. Thoroughly clean threads of piston head **6**, piston rod **2**, seal carrier **4**, screwed ring **1** (if fitted) and cylinder with a wire brush. Ensure that all threads are free from grease, hydraulic oil and old sealing compound using JCB Cleaner/Degreaser. Allow solvent to dry for 15 minutes before applying JCB Activator.

* Ensure that lubricants used during assembly do not come into contact with sealing compound.

  When fitting seal ensure internal seal remains seated squarely in its groove and is not twisted.

  Before fitting the seal carrier **4** onto the piston rod **2**, wrap tape around the piston rod threads to protect the gland seal from damage and the threads from oil and grease.

* Apply JCB Activator to the threads of the piston head **6** and piston nut **5**. Allow to dry for 15 minutes before bringing into contact with sealing compound.

* **Note:** Sealing Compound and JCB Activator must not contact seals, bearing rings or 'O' rings.

* Apply JCB Threadlocker and Sealer (High Strength) to all threads of the piston rod **2**.

* Taking care to retain the screwed ring **1** at the further end of the piston rod from the cylinder (on the type 2 only), coat thread of cylinder with JCB Activator. Next apply JCB Threadlocker to thread of end cap. Wait 15 minutes before bringing the two together and then torque-tighten the end cap into the cylinder.

* **Note:** If hydraulic oil contacts uncured sealing compound, a weakening of the bond will result. Cure times vary according to the ambient temperature and type of Activator used. The following approximate cure times apply at 20 °C (68 °F) and are the minimum periods between assembly and filling the ram with oil.

* JCB Threadlocker or Threadlocker and
  Sealer (High Strength) with JCB Activator - 1 hour

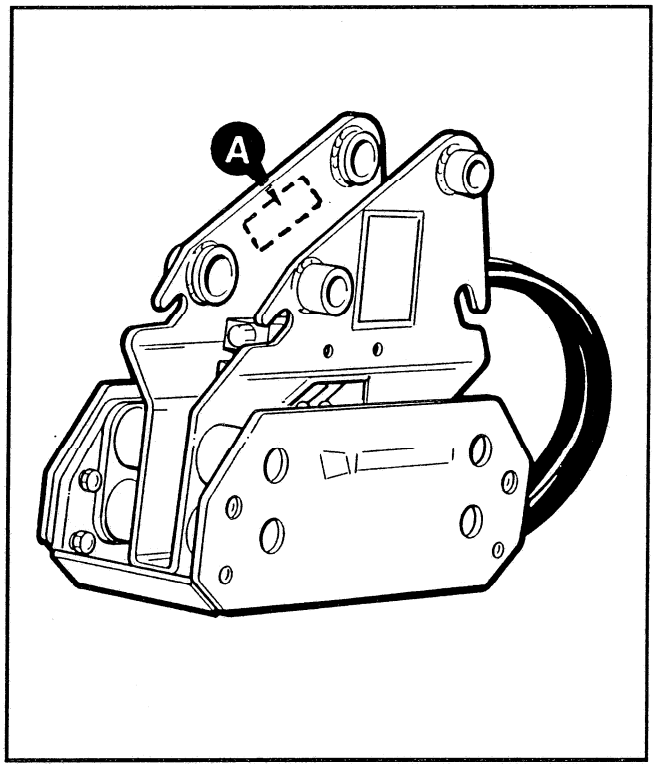
  Note: Cold weather operation. When operating in conditions which are consistently below freezing, it is recommended that the rams are operated slowly to their full extent before commencing normal working.

Contents

Compactor Identification

The attachment part number is engraved on a data plate **A**.

Always quote this part number when ordering replacement parts.



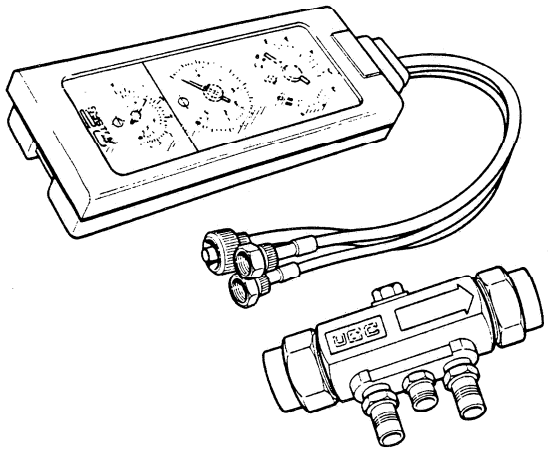
Safety

⚠ WARNING

You or others can be injured if you operate or maintain any attachments without first studying the machine Operator Handbook and the attachment Operator Handbook. Read the safety instructions before operating or maintaining the attachment. Do not operate or maintain the attachment without the relevant manuals or if there is anything you do not understand.

ATT-1-1

Service Tools

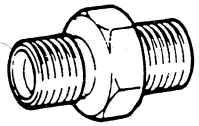


Flow Test Equipment

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	Adaptor 3/4 in M x 3/4 in M BSP

Bonded Washers

1406/0021 3/4 in BSP (4 off)



Male Adaptors - BSP x BSP

1604/0006 3/4 in x 3/4 in

Lubricants

ITEM	CAPACITY Litres (UK Gal)	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Hydraulic System	As detailed in the machine Operator Handbook, Service Capacities and Lubricants	JCB High Performance Hydraulic Oil (Above 38 °C, 100 °F)	ISO VG46
		JCB Special Hydraulic Fluid (Below 38 °C, 100 °F)	ISO VG32
Grease Points	- - -	JCB MPL Grease	Lithium based, No.2 consistency

Service Schedules

Every 2-4 Operating Hours

Grease

1 Nipples on offset weight casing (2 off).

Daily

Clean

1 Grease nipples on hanger bracket bores.

2 Grease nipples on offset weight casing.

3 Plate area of attachment.

4 Inside of base to remove debris.

Check

1 Tightness of all nuts and bolts.

2 Hoses and pipework for chafing/damage.

3 Hydraulic system for leaks.

Grease

1 Hanger bracket bores (4 off).

2 Offset weight casing bearings (2 off).

Greasing

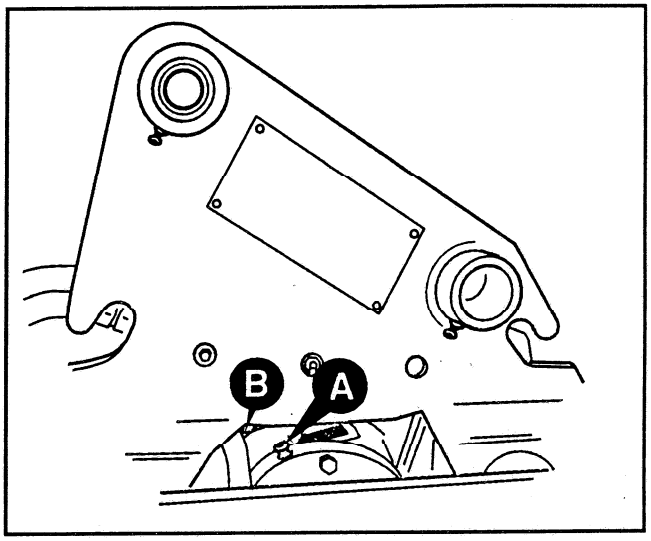
The attachment must be greased regularly to keep it working efficiently. Regular greasing will also increase the attachment's working life.

Grease should be applied with a grease gun.

⚠ WARNING

Do not work on the machine with the Compactor plate vibrating or with the engine running.

B-2-2-2



Daily (before use)

1 Clean the grease nipples, located on the bores (4 off) of the hanger bracket, and apply 2-3 shots of **JCB MPL Grease.**

2 Clean the grease nipples **A** and **B** located on the offset weight casing and apply 2-3 shots of **JCB MPL Grease.**

Every 2-4 hours whilst working

1 Clean the grease nipples located on the offset weight casing and apply 2-3 shots of **JCB MPL Grease.**

Technical data

Note: System Cleanliness is to be to ISO/6/13.

Model	JCB Compactor
Weight	178.5 kg (393.6 lb)
Overall width	305 mm (12 in)
Overall length	739 mm (29.1 in)
Compaction area	0.149 m^2 (230.8 in^2)
Cycles per minute	2000
Frequency	33.3 Hertz
Amplitude	3.8 mm (0.15 in)
Centrifugal force	16.3 kN (3664 lbf, 1663 kgf)
Hose sizes - inlet and outlet	3/4 in (19 mm)
Hydraulic requirements	
Oil flow required The Compactor is designed to operate off circuits supplying up to 150 l/min (i.e. a High Flow Circuit). (33 gal/min) but uses a flow restrictor set at 24 l/min	24l/min (5.28 gal/min)
Hydraulic motor	
Type	Ultra/Dowty IMR012 RSSTPN
Displacement	24 l/min (5.28 gal/min)
Speed	2000 r.p.m.
Torque	43 Nm (31.7 lbf ft, 4.4kgf m)
Regulator valve	
Type	Integrated Hydraulics 2FP95 P6W95S
Setting	Preset at 24 l/min regulated line with 150 l/min at inlet
Rubber mounts	Nitrile rubber 60 Shore hardness. Diesel and hydraulic oil resistant.
Hoses	All hydraulic hoses on this attachment are of the highest quality and conform to the following JCB standards: JCB 1000/1000 JCB 1000/0300 JCB 5000/6001

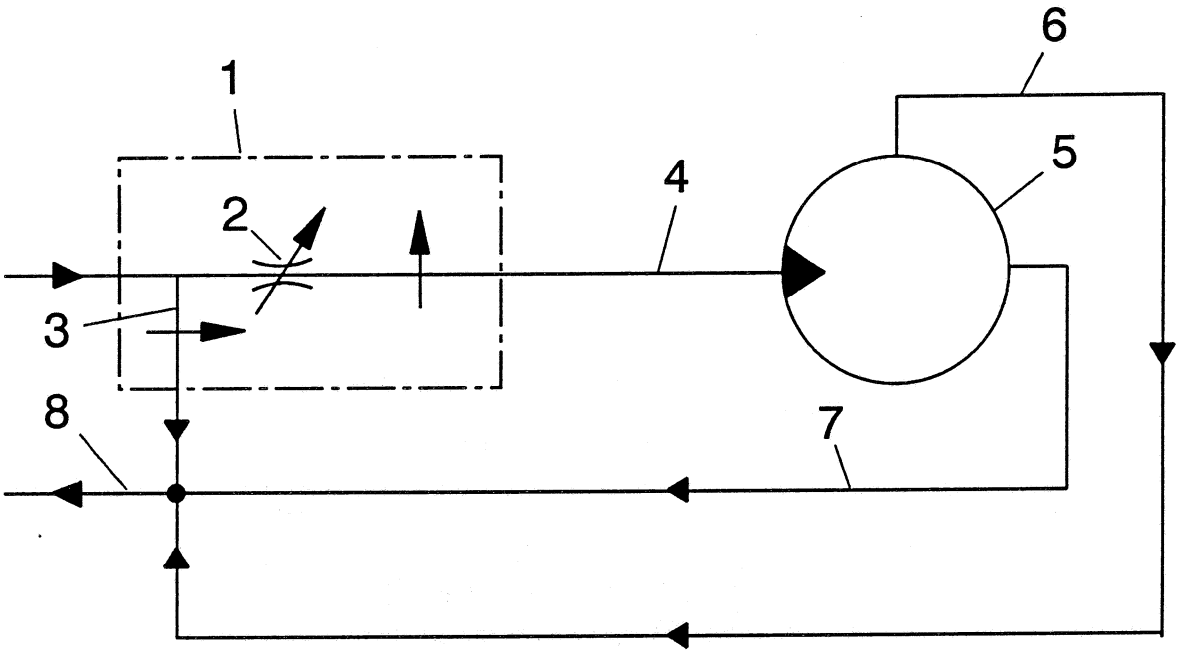
Hydraulic Circuit

Component Key

1 Adjustable Flow Regulator Valve
2 Adjustable Orifice
3 Bypass Line
4 Regulated Line
5 Hydraulic Motor
6 Motor Casing Drain
7 Motor Return Line
8 Flexible Return Line

Description

Hydraulic fluid is passed from the machine hydraulic circuit to the regulator valve **1**. The pre-set adjustable orifice **2** returns excess flow via the bypass line **3** and the regulated flow is passed via the regulated line **4** to the hydraulic gear motor **5**. The hydraulic motor **5** drives an offset weight to produce the necessary vibration. Oil is returned to tank line **8** by the return line **7** and casing drain line **6**.

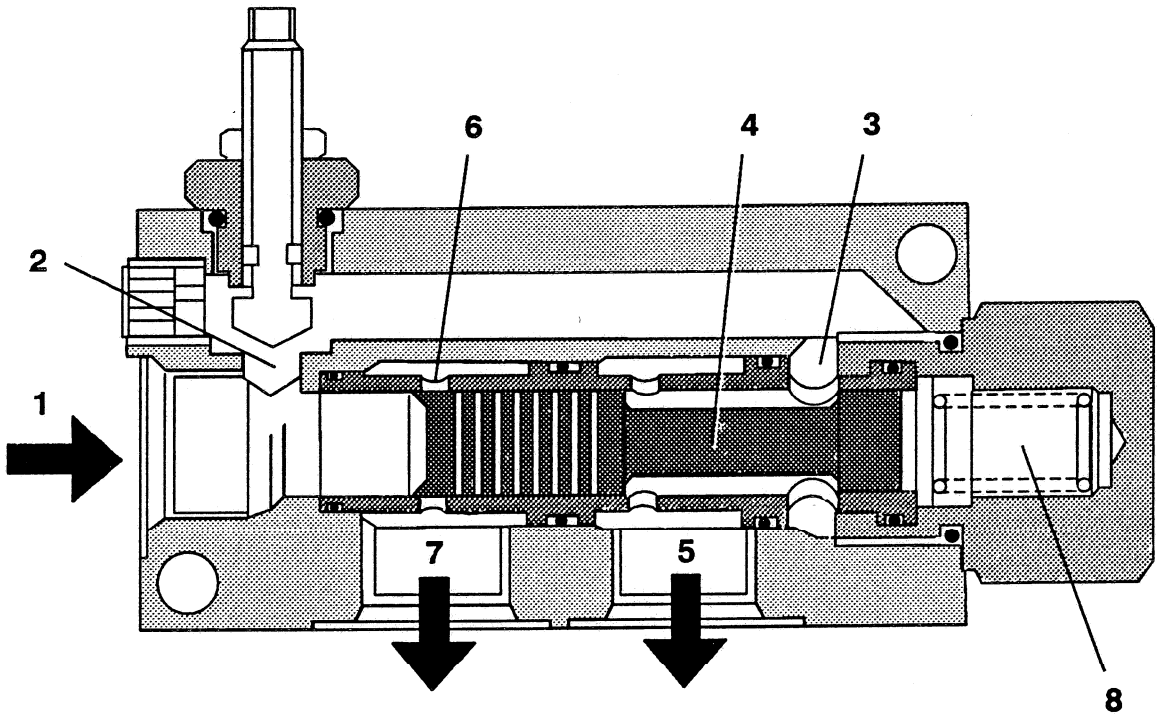


Regulator Valve

Description

The regulator valve is a three part block type flow regulator. It is used to regulate the flow from a fixed supply (i.e. the machine hydraulic system). The valve passes the required flow to the gear type hydraulic motor (see Hydraulic Motor) and the surplus flow is diverted to the bypass port.

Inlet flow **1** passes through the adjustable orifice **2** to the radial holes **3** in the spool/sleeve assembly **4** then out of the regulated port **5**. The pressure drop across the orifice is sensed at each end of the spool, producing a force which at the required flow rate overcomes the force of the spring **8**. The movement of the spool regulates the flow by opening the radial valve ports **6** to the bypass port **7** and closing the regulated flow ports **3**.



Regulator Valve (continued)

Note: Do not attempt to work on this valve whilst the Compactor is attached to the main machine circuit.

Removal and Replacement

Removal

⚠ WARNING

Hydraulic fluid at pressure can injure you. Follow the instructions below for disconnecting the hoses.

B-2-1-9

1 Loosen the hydraulic connectors at **A**, **B** and **C** to ensure that no residual pressure is trapped in the system.

2 Disconnect the fittings at **A**, **B** and **C** and collect any fluid in a suitable container. Plug the hoses.

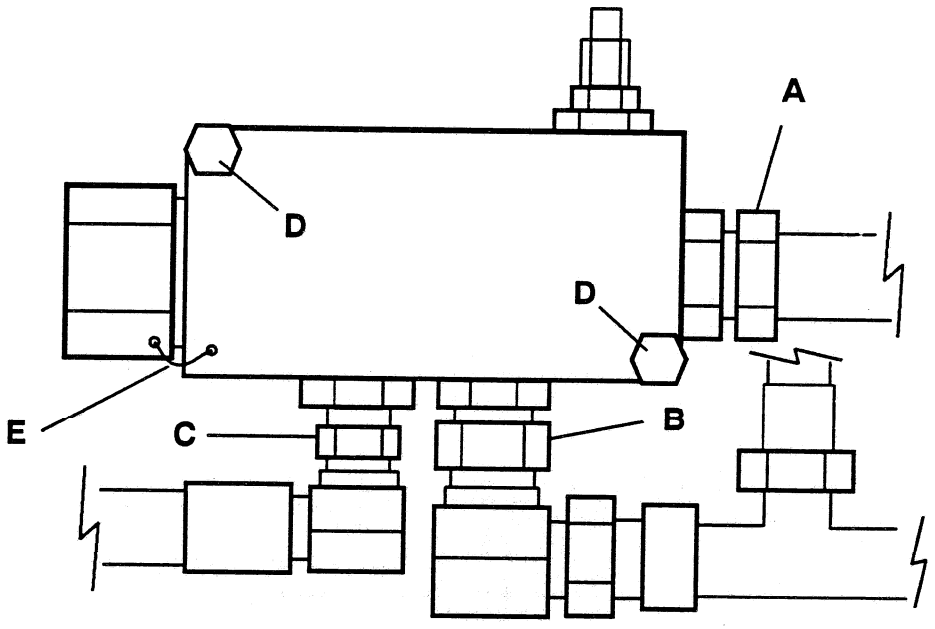
3 Remove two bolts **D** together with their nuts and washers. Remove the regulator valve. If the valve is to stand for any length of time plug the ports.

4 Do not remove locking wire **E** unless the valve is to be dismantled.

Replacement

Replacement is a reversal of the removal procedure.

Torque tighten bolts **D** to 56 Nm (42 lbf ft, 5.7 kgf m).



Regulator Valve (continued)

Dismantling and Assembly

Dismantling

1 Hold the body of the valve **1** in a soft jawed vice.

2 Remove the wirelock from cap **2**.

3 Remove cap **2** taking care to retain spring **3**.

4 Remove spool assembly **4**.

5 Remove and discard all 'O' rings and backing rings from the spool assembly.

6 Remove pressure plug **5**.

7 Remove the adjuster **6**, discard 'O' ring **7**.

8 Wash the valve body, spool assembly and adjuster in a suitable solvent and allow to dry.

9 Examine all ports for scoring or excessive wear. If any part has to be replaced, replace the complete valve.

Assembly

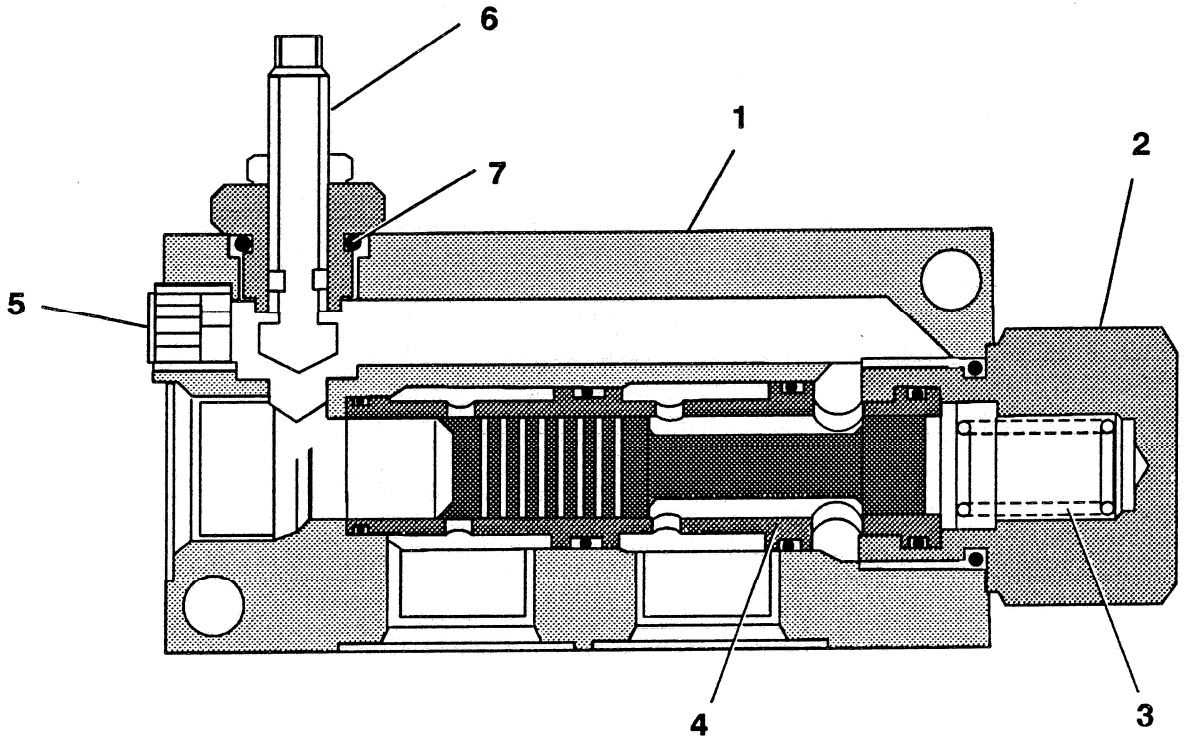
1 Lightly oil all parts

2 Refit pressure plug **5**.

3 Fit a new 'O' ring **7** and refit adjuster **6**. Torque tighten to 40 - 48 Nm (29.5 - 35 lbf ft, 4.0 - 4.8 kgfm). Do not allow valve cap to be tightened onto the orifice seat.

4 Insert all 'O' rings and backing rings in the spool assembly **4**. Carefully fit the spool assembly into the valve body.

5 Fit 'O' ring and spring **3** into cap **2**. Refit the cap to the valve body **1**. Torque tighten to 68 Nm (50 lbf ft, 6.9 kgfm). Wirelock cap **2** to valve body **1**.



Regulator Valve (continued)

Adjustment and Test

WARNING

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

1 Connect the flow test equipment (see **Special Tools**) at **A** between the regulator valve **1** and the hose **4**.

2 Remove the inlet hose **4** and the return line hose **7** from the motor at **B** and **C**. Using a male coupling (JCB part No. 1604/0006) connect inlet hose **4** to return line hose **7**.

Note: This adjustment and test is carried out with the Compactor connected to the main machine hydraulic circuit. Obey all safety precautions laid down in the machine Operator Handbook together with any given in this manual.

WARNING

Hydraulic fluid pressure can injure you. Make the machine safe before removing the hose blanking plugs or connecting/disconnecting the hoses; stop the engine and then operate the attachment control a few times to vent system pressure.

2-4-1-5/1

3 Remove the motor drain hose at **D** and plug the hose. The ports (inlet, outlet drain) on the motor should also be plugged to prevent dirt entering the motor.

4 Connect the Compactor to the machine Hydraulic circuit (see **Quick Release Couplings** in the machine Operator Handbook).

WARNING

If two people are doing this job make sure that the person working the controls is a competent operator. If the wrong control lever is moved, or if the controls are moved violently, the other person could be killed or injured.

B-2-1-8

5 Start the engine and allow the machine hydraulic pressure to build up. Check the Compactor hydraulic circuit for leaks. If leaks are found stop the engine, relieve residual hydraulic pressure and tighten joints as necessary.

6 When the circuit is sound, loosen locknut **E** on the regulator valve.