



HYDRAPOWER

# Service Manual

801.4

801.5

801.6

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Product: JCB 801.4,801.5,801.6 Mini Excavator Service Repair Manual  
Full Download: <https://www.arepairmanual.com/downloads/jcb-801-4801-5801-6-mini-excavator-service-repair-manual/>

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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.

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

For example, renewal of oil seals, gaskets etc., and any component showing obvious signs of wear or damage is expected as a matter of course and, therefore, information of this nature is included only 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. Finally, please remember above all **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 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 may not be 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.

Illustrations 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 plus or minus 3%. Torque figures indicated are for dry threads, hence for lubricated threads may be reduced by one third.

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

References to alternative servicing intervals are to be treated on a 'whichever occurs first' basis.



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### Identification Plate

Your machine is fitted with an identification plate which is located on the front of the mainframe.

		<b>JCB HYDRAPOWER LTD</b> <b>RIVERSIDE, RUGELEY,</b> <b>STAFFS, ENGLAND</b> <b>CONSTRUCTOR</b>	<small>BSEN ISO9001</small>  <small>FMI 4063</small>
<input type="text"/>		Product	<input type="text"/>
VIN Vehicle Identification Number		Identification	
<input type="text"/>		Number	
ENGINE SERIAL NUMBER			<input type="text"/>
<input type="text"/>			LH TRACK GEARBOX SERIAL NUMBER
SLEW GEARBOX SERIAL NUMBER			<input type="text"/>
<input type="text"/>			RH TRACK GEARBOX SERIAL NUMBER
WEIGHT kg			<input type="text"/>
			ENGINE POWER kW @ RPM

H04340

### Preparation for Storage

The operations to place a machine into storage (-15°C to 44° C) are given below.

- 1 Park the machine safely with the bucket and dipper rams retracted and the dig end outstretched. Lower the boom until the bucket rests on the ground. Lower the dozer to the ground.
- 2 Switch off the engine. Operate controls to release pressure from the rams.
- 3 Disconnect battery to prevent discharge.
- 4 Ensure the fuel tank is filled to a maximum, leaving no air space.
- 5 Ensure hydraulic tank is filled to maximum on the sight gauge.
6. Spray exposed ram rods with Waxoyl.
7. Slacken off rubber tracks until no visible spring tension exists.

### Preparation after Storage

The operations to remove a machine from storage (-15°C to 44° C) and prepare it for use are given below.

- 1 Lower the fuel tank to ensure that sufficient air space exists in the tank.
- 2 Check all oil and water levels, adjust contents to correct levels as necessary.
- 3 Ensure the battery is fully charged.
- 4 Reconnect battery.
- 5 Remove electrical contact from fuel injection pump solenoid.
- 6 Crank engine for 20 seconds or until oil pressure warning light goes out.
- 7 Reconnect electrical supply to the fuel injection pump solenoid.
- 8 Start the engine. If the engine fails to start after several attempts, bleed the fuel system.
- 9 Adjust track tensions.
- 10 Grease all lubrication points.

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## Safety Notices

In this handbook 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 Mini Excavator 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

As well as the warnings in the following pages, specific warnings are given throughout the book. This section is designed to give a safety code for use of the machine generally and for operation and maintenance practices.

## **General Safety**

### **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**

#### **Clothing**

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

### **WARNING**

#### **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**

#### **Raised Equipment**

Raised equipment can fall and injure you. Do not walk or work under raised equipment unless safely supported.

13-1-1-6

### **DANGER**

Before removing the boom from the machine, ensure that the counterweight is adequately supported as in certain ground conditions the machine could tip backwards. Never travel or transport the machine with the boom removed.

BF 6-3

## Operating Safety

### **WARNING** Engine

The engine has 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

### **WARNING** Entering/Leaving

Always face the machine when entering and leaving the cab. Use the step(s) and handrails. make sure the step(s), handrails and boot soles are clean and dry. Do not jump from the machine. Do not use the machine controls as handholds, use the handrails.

INT-2-1-7

### **WARNING** Visibility

Accidents can be caused by working in poor visibility. Keep windows clean and use your lights to improve visibility. Do not operate the machine if you cannot see properly.

INT-2-1-11

### **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** Exhaust Gases

Breathing the machine exhaust gases can harm and possibly kill you. Do not operate the machine in closed spaces without making sure there is good ventilation. If possible, fit an exhaust extension. If you begin to feel drowsy, stop the machine at once. Get out of the cab into fresh air.

INT-2-1-10

### **WARNING** Hazardous Atmospheres

This machine is designed for use in normal outdoor atmospheric conditions. It should not be used in an enclosed area without adequate ventilation. Do not use the machine in a potentially explosive atmosphere, i.e. combustible vapours, gas or dust, without first consulting your JCB Hydrapower Distributor.

INT-2-1-14

### **WARNING** Ramps and Trailers

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.

INT-2-2-6

### **WARNING** Communications

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure any hand signals that may be used are understood by everybody. Work sites can be noisy, do not rely on spoken commands.

INT-2-2-3

### **WARNING** 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** Controls

Keep the machine controls clean and dry. Your hands and feet could slide off slippery controls. If that happens you will lose control of the machine.

2-2-3-6

## Maintenance Safety

### **WARNING** Soft Ground

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

INT-3-2-4

### **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** Communications

Bad communications can cause accidents. If two or more people are working on the machine, make sure each is aware of what the others are doing. Before starting the engine make sure the others are clear of the danger areas; examples of danger areas are: the rotating blades and belt on the engine, the attachments and linkages, and anywhere beneath or behind the machine. People can be killed or injured if these precautions are not taken.

INT-3-1-5

### **WARNING** 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 and injury if you do not follow these precautions.

INT-3-2-2

### **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** Oil

Oil is toxic. If you swallow any oil, do not induce vomiting, seek medical advice. Used engine oil contains harmful contaminants which can cause skin cancer. Do not handle used engine oil more than necessary. Always use barrier cream or wear gloves to prevent skin contact. Wash skin contaminated with oil thoroughly in warm soapy water. Do not use petrol, diesel fuel or paraffin to clean your skin.

INT-3-2-3

### **WARNING** Fires

If your machine is equipped with a fire extinguisher, make sure it is checked regularly. Keep it in the operator's cab until you need to use it.

Do not use water to put out a machine fire, you could spread an oil fire or get a shock from an electrical fire. Use carbon dioxide, dry chemical or foam extinguishers. Contact your nearest fire department as quickly as possible. Firefighters should use self-contained breathing apparatus.

INT-3-2-7/1

### **WARNING** 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** Battery Gases

Batteries give off explosive gases. Keep flames and sparks away from the battery. Do not smoke close to the battery. Make sure there is good ventilation in closed areas where batteries are being used or charged. Do not check the battery charge by shorting the terminals with metal; use a hydrometer or voltmeter.

INT-3-1-8

### **WARNING** Battery Terminals

The machine is negatively earthed. Always connect the negative pole of the battery to earth.

When connecting the battery, connect the earth lead (-) last. When disconnecting the battery, disconnect the earth lead (-) first.

INT-3-1-9

### **WARNING** 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**

Never use water or steam to clean inside the cab. The use of water or steam could damage the on-board computer and render the machine inoperable. Remove dirt using a brush or damp cloth.

8-3-4-8

**Maintenance Safety (cont'd)**

 **CAUTION**  
**Arc Welding**

Before carrying out any arc welding on the machine, completely remove the Control Computer to avoid damage to the circuits; also disconnect the alternator plug and battery leads.

\*When welding items to the mainframe make sure that the earth clamp is positioned on the mainframe and when welding to the undercarriage make sure the earth clamp is positioned on the undercarriage. If you earth one and weld the other, you may cause severe damage to the slew ring.

Always connect the earth clamp to any other component being welded, i.e. boom or dipper, to avoid damage to pivot pins and bushes.

8-1-2-6/1

 **WARNING**  
**Hydraulic Hoses**

Damaged hoses can cause fatal accidents. Inspect the hoses regularly for:

- Damaged end fittings
- Chafed outer covers
- Ballooned outer covers
- Kinked or crushed hoses
- Embedded armouring in outer covers
- Displaced end fittings.

INT-3-3-2

 **WARNING**

DO NOT remove the hydraulic tank filler cap or cover plate when the engine is running. The hydraulic system is under pressure. You or others could be injured. First stop the engine and then release the pressure.

8-3-4-4/1

 **WARNING**  
**Hydraulic Pressure**

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the engine and operate the controls to release pressure trapped in the hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11/1

 **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-3-2-4

 **CAUTION**  
**Rams**

The efficiency of the rams will be affected if they are not kept free of solidified dirt. Clean dirt from around the rams regularly. When leaving or parking the machine, close all rams if possible to reduce the risk of weather corrosion.

INT-3-2-10

 **CAUTION**  
**Cleaning**

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

INT-3-2-11

 **CAUTION**  
**'O' rings, Seals and Gaskets**

Badly fitted, damaged or rotted 'O' rings, seals and gaskets can cause leakages and possible accidents. Renew whenever disturbed unless otherwise instructed. Do not use Trichloroethane or paint thinners near 'O' rings and seals.

INT-3-2-12

 **WARNING**  
**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 system pressure escape, then remove the cap.

INT-3-2-9

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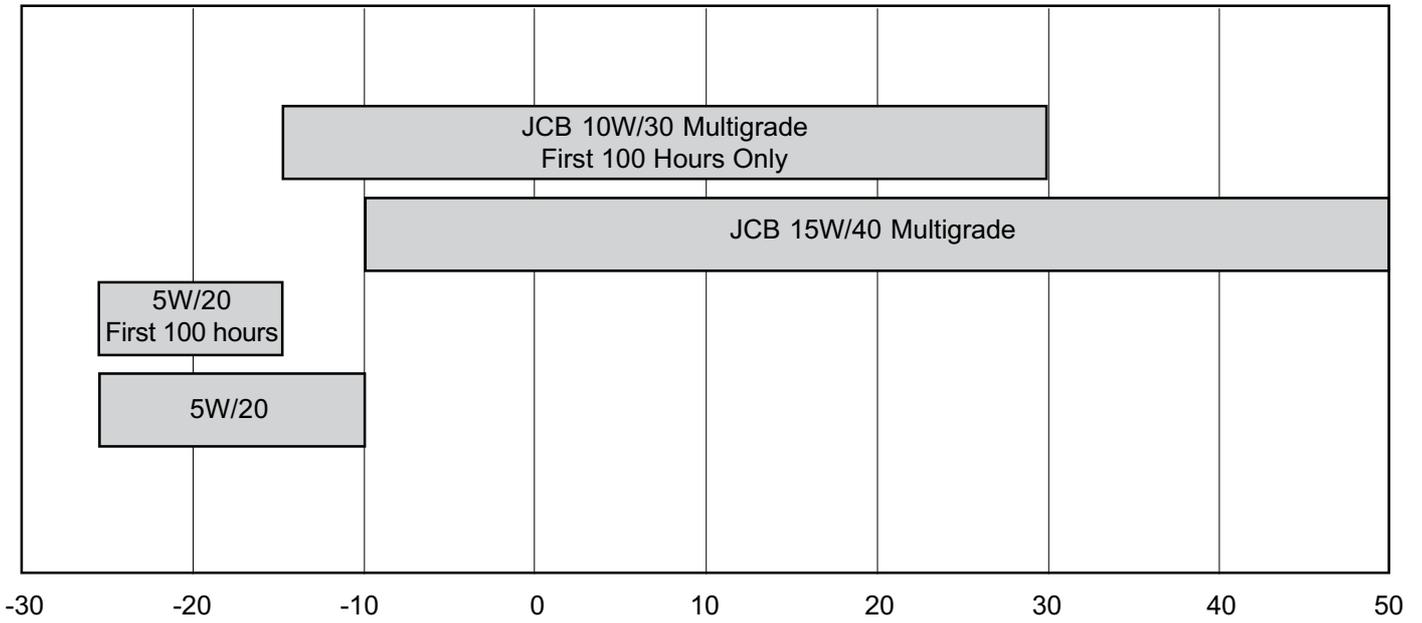
\*New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the piston cylinder bores, resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load). Engines of new machines are filled at the factory with JCB 10W/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown in the lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours operation, it is essential that the 10W/30 oil is replaced by the lubricant recommended below.

ITEM	CAPACITY Litres (Gal)	FLUID / LUBRICANT	INTERNATIONAL SPECIFICATION
<b>Fuel Tank</b>	17.0 (3.75)	Diesel Oil (See Types of Fuel)	ASTM D975-66T Nos. 1D, 2D
<b>Engine (Oil)</b> First 100 hours only	3.5 (0.77)	<b>JCB 10W/30 Multigrade</b> above -15°C (above 5°F) <b>5W/20</b> -15°C to -25°C (5°F to -13°F)	MIL-L-46152, API CC/SF API CC/SE (recommended)
After first 100 hours		<b>JCB 15W/40 Multigrade</b> above -10°C (above 14°F) <b>5W/20</b> -10°C to -25°C (14°F to -13°F)	SAE15W/40, MIL-L-46152B, API CD/SE MIL-L-2104D API CC/SE or API CD/SE
<b>Engine (Coolant)</b> Canopy Cab	4.5 (1.0) 5.0 (1.1)	<b>JCB Universal Antifreeze/water</b> (See <b>Coolant Mixtures</b> )	ASTM D3306-74
<b>Track Gearbox (each)</b>	0.3 (0.07)	<b>JCB SAE 30 Engine Oil</b> (NOT Multigrade)	API CD/SF, MIL-L-46152 MIL-L-2104D
<b>Slew Gearbox (Lubrication)</b> 801.4 to M721136 801.5 to M730003 801.6 to M728056 801.4 M721137 on 801.5 M730004 on 801.6 M728057 on	0.7 (0.15)	<b>From Hydraulic System</b>  <b>JCB HD90 Gear Oil</b> Below 0°C (32°F) <b>JCB HD140 Gear Oil</b> 0°C to 40°C (32°F to 104°F)	API-GL-5, MIL-L-2105D API-GL-5, MIL-L-2105D
<b>Track Idler Wheels</b>	0.025 (0.006)	<b>JCB HD90 Gear Oil</b>	API-GL-5, MIL-L-2105D
<b>Track Rollers</b>	0.025 (0.006)	<b>JCB HD90 Gear Oil</b>	API-GL-5, MIL-L-2105D
<b>Hydraulic System</b>	30 (6.6)	<b>JCB Special Hydraulic fluid</b> Below -10°C (14°F) <b>JCB Hydraulic Fluid 46</b> -10°C to 40°C (14°F to 104°F) <b>JCB Hydraulic Fluid 68</b> Over 40°C (104°F)	
<b>Slew Ring</b> Bearings Gear Teeth		<b>JCB MPL Grease</b> <b>JCB Slew Pinion Grease ##</b>	Lithium based, No. 2 consistency.
<b>All Other Grease Points</b>		<b>JCB MPL Grease</b>	Lithium based, No. 2 consistency.

#### ## WARNING

JCB Slew Pinion Grease is harmful. It contains bitumen compounds 2811 with possible risks of irreversible effects. Excessive contact may lead to dermatitis or skin cancer. Always use a barrier cream or wear gloves. Wash contaminated skin thoroughly with soap and water. In the event of contact with the eye, immediately wash with plenty of water and seek medical advice.

**\*Engine Lubrication Chart**



**\*Every 10 Operating Hours (Or Daily)  
whichever occurs first**

**Clean**

- 1 Machine generally

**Check and Adjust where necessary (engine stopped)**

- 2 Generally for damage  
3 Hydraulic oil level  
4 Engine oil level  
5 Engine coolant  
6 Fuel system for leaks  
7 Operation of horn  
8 Operation of all other electrical equipment  
9 Track adjustment

**Check and Adjust where necessary (engine running)**

- 10 Exhaust (excessive smoke)  
11 Dozer operation  
12 Excavator operation  
13 Track and Running Gear operation  
14 Hourmeter operation

**Grease**

- 15 All pivot pins

**Every 50 Operating Hours (Or Weekly)  
whichever occurs first**

Do the daily jobs plus:

**Clean**

- 1 Drain and clean fuel filter  
2 Drain fuel sediment bowl  
3 Radiator matrix

**Check and Adjust where necessary (engine stopped)**

- 4 Fan belt adjustment (see Note 1)

**Note 1:** Failure to maintain correct fan belt adjustment may result in damage to the timing case cover.

**First 100 Hours Only**

Do the jobs listed in 50 hours plus:

**Change**

- 1 Engine oil and filter canister  
2 Slew gearbox oil.

**Every 100 Operating Hours (Or 2 Weeks)  
whichever occurs first**

Do the daily jobs through to 50 hours plus:

**Clean**

- 1 Battery terminals

**Check and Adjust where necessary (engine stopped)**

- 2 Hose and pipework for security and damage  
3 Condition of ram piston rods  
4 All grease seals  
5 Track plate condition/rubber condition  
6 Engine mounting bolts  
7 Air cleaner hose security  
8 Wiring for damage  
9 Track tension

**First 250 Operating Hours**

- 1 Change track gearbox oil  
2 Check kingpost pivot pins retaining bolt torque.

**Every 250 Operating Hours (Or Monthly)  
whichever occurs first**

Do the daily jobs through to 100 hours plus:

**Change**

- 1 Engine oil and filter canister

**Check**

- 2 Operation of excavator lever and swing pedal lock(s)

**Grease**

- 3 Slew ring grease nipples

**Every 500 Operating Hours (Or 6 Months)  
whichever occurs first**

Do the daily jobs through to 250 hours plus:

**Clean**

- 1 Fuel lift pump  
2\*\* Fuel injectors (and test)

**Note:** Jobs which should only be done by a specialist are indicated by \*\*

**Change**

- 3 Fuel filter element
- 4\*\* Hydraulic fluid return filter
- 5 Outer air cleaner element (very dusty conditions only)

**Every 500 Operating Hours (Or 6 Months) continued****Check and Adjust where necessary (engine stopped)**

- 6 Exhaust system security
- 7\*\* Cylinder head torque tighten
- 8\*\* Valve clearances

**Check and Adjust where necessary (engine running)**

- 9\*\* Main relief valve pressure
- 10\*\* Auxiliary relief valve pressures
- 11\*\* Slew crossline relief valve
- 12\*\* Engine idle speed
- 13\*\* Engine maximum speed

**Every 1000 Operating Hours (Or Yearly) whichever occurs first**

Do the daily jobs through to 500 hours plus:

**\*Change**

- 1 Air filter dust valve
- 2 Air filter element (outer)
- 3 Track gearbox oil
- 4 Slew gearbox oil

**Check**

- 5 Cab frame

**Grease**

- 6 Slewing pinion and slew ring teeth

**Every 2000 Operating Hours (Or 2 Years) whichever occurs first**

Do the daily jobs through to 1000 hours plus:

**Change**

- 1. Air cleaner element (inner)
- 2\*\* Track idler and rollers oil and seals
- 3\*\* Hydraulic fluid and clean suction strainer
- 4 Engine coolant

**Check (engine stopped)**

- 5 Battery electrolyte level (low maintenance)
- 6\*\* Valve clearance and lubrication
- 7\*\* Starter motor and alternator brush gear

**Note:** *Jobs which should only be done by a specialist are indicated by \*\**

You must grease the machine regularly to keep it working efficiently. Regular greasing will also lengthen the machine's working life.

Greasing should be done with a grease gun. Normally, two strokes of the gun should be enough. Stop greasing when fresh grease appears at the joint.

For the types of grease to use at each point see the **Lubricants and Capacities** chart.

Do not mix different types of grease, keep them separate.

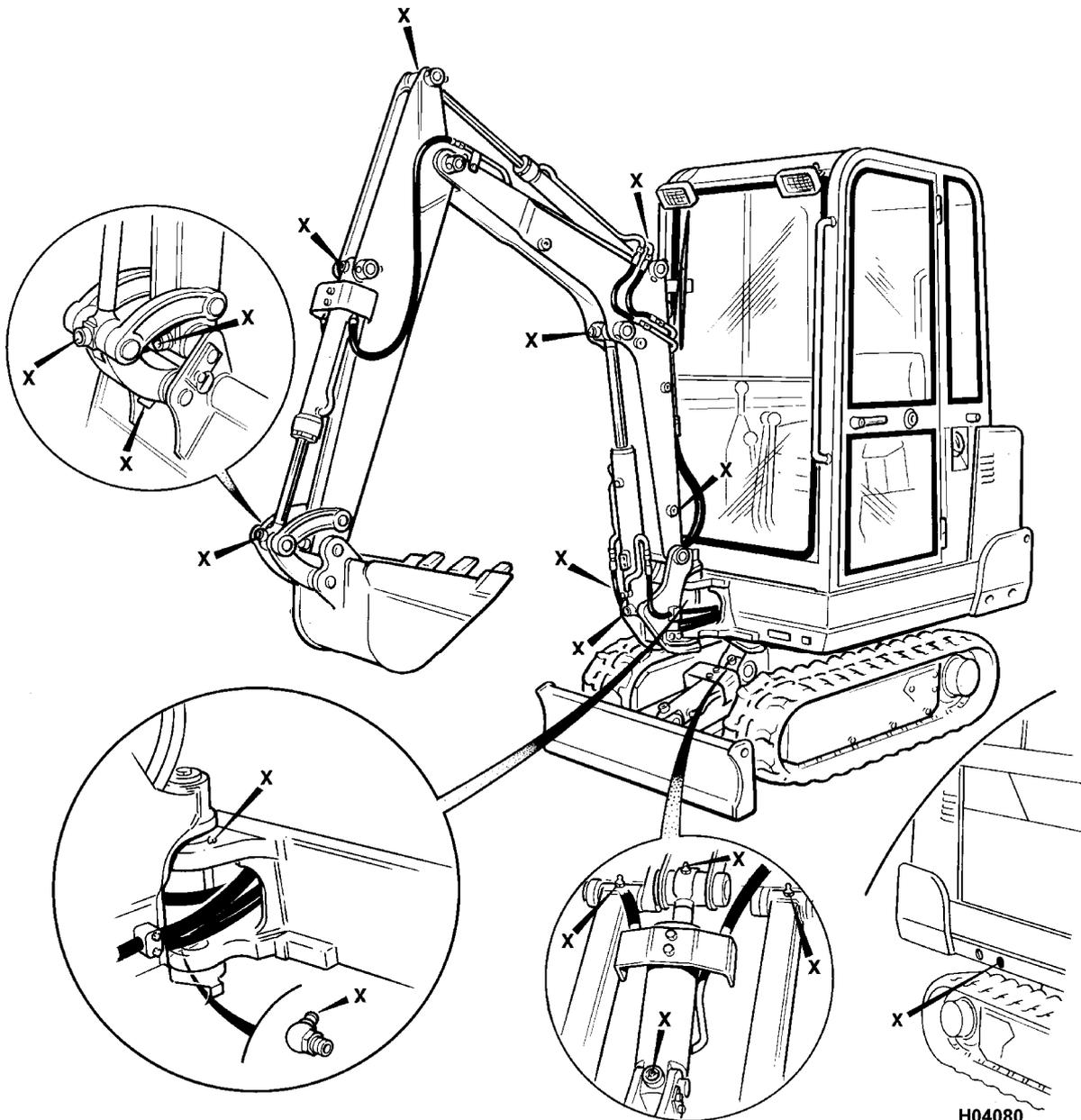
**Note:** Some optional attachments may need greasing more often. See Section A - ATTACHMENTS .

**WARNING**

You will be working close into the machine for these jobs. Lower the attachments if possible. Remove the starter key . This will prevent the engine being started.

8-3-1-3

**Daily**



## Every 250 Hours

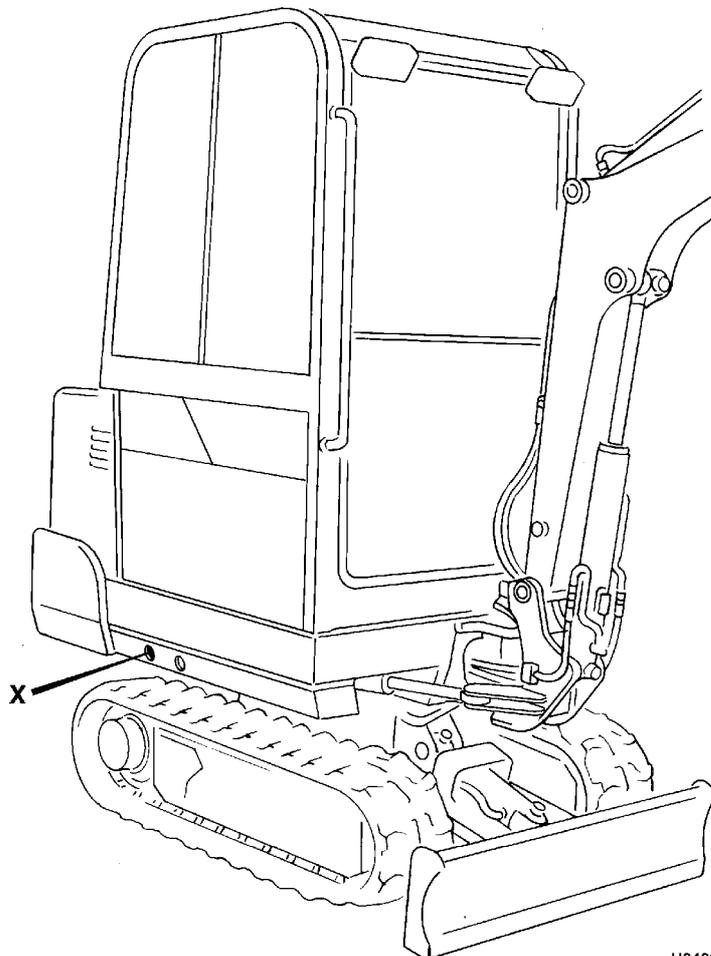
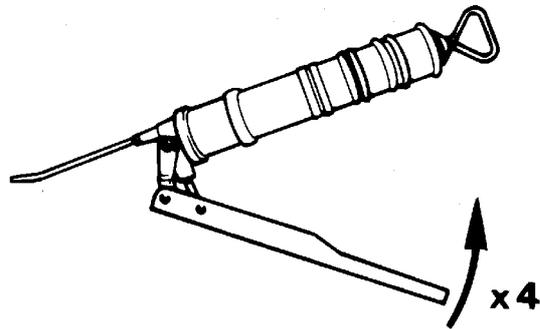
### Slew Ring Bearings

Ensure the slew ring is kept full of grease.

Grease point on right hand side of mainframe.

To ensure distribution of grease, use the following procedure:

- 1 Grease 'IN', rotate 180°
- 2 Grease 'IN', rotate 180°
- 3 Grease 'IN',



H04090

## Every 1000 Hours

### Slew Ring Gear Teeth

#### WARNING

JCB Slew Pinion Grease is harmful as it contains bitumen compounds 2811. Excessive contact may lead to dermatitis or skin cancer. Always use a barrier cream or wear gloves; wash contaminated skin thoroughly with soap and water. In the event of eye contact, immediately wash with plenty of water and seek medical advice.

8-1-1-7

#### WARNING

##### Soft Ground

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

INT-3-2-4

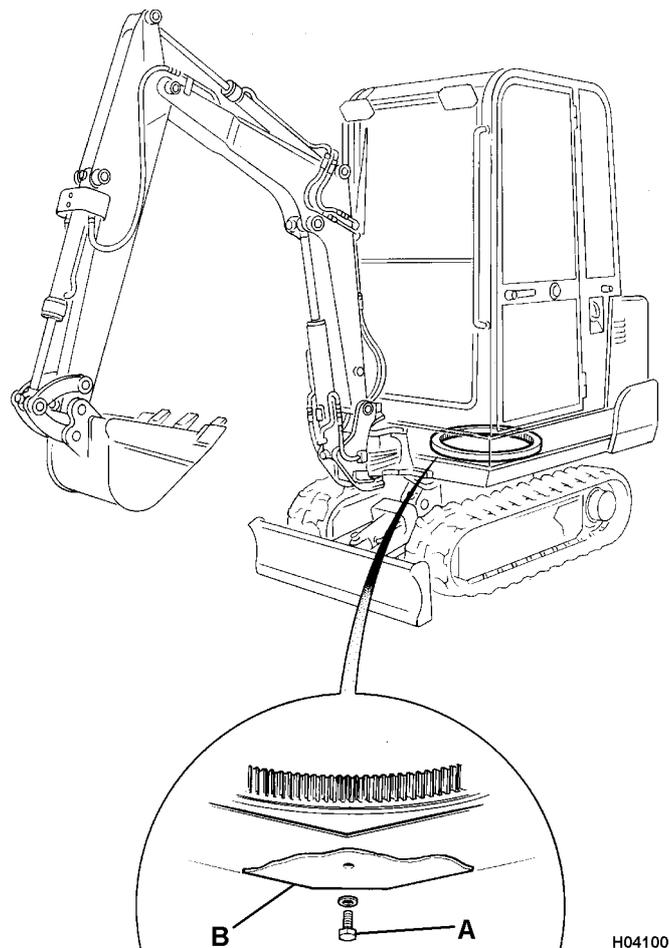
#### WARNING

##### Jacking

A machine can roll off jacks and crush you. Do not work under a machine supported only by jacks.

MD-1-6-1

- 1 Raise machine and support the undercarriage.
- 2 Remove the bolts **A** and plate **B** in the underside of the undercarriage.
- 3 Apply the grease to the pinion using an applicator (see **Lubricants & Capacities**).
- 4 Remove personnel from the machine.
- 5 Slew the machine through 360° twice.
- 6 Stop the engine.
- 7 Repeat step 3 as necessary.
- 8 Refit the plate **B** and bolts **A**.
- 9 Lower the machine to the ground.



H04100

## Cooling System

### WARNING

The cooling system is pressurised when the coolant is hot. Hot coolant will burn you. Make sure that the engine is cool before checking the coolant level or draining the system.

#### Checking the Coolant level

- 1 Prepare the Machine**  
Park the machine on level ground and raise the engine cover.
- 2 Remove the Filler Cap**  
Carefully slacken cap **A**. Let any pressure escape. Remove the cap
- 3 Check the Level**  
The level should be 12mm (0.5in) below the filler neck. Top up with pre-mixed water/antifreeze if necessary. See **Coolant Mixtures**.
- 4 Refit the Filler Cap**  
Make sure it is tight

**Note:** Check the quality of the antifreeze mixture every year - before the cold weather starts. Change it every two years.

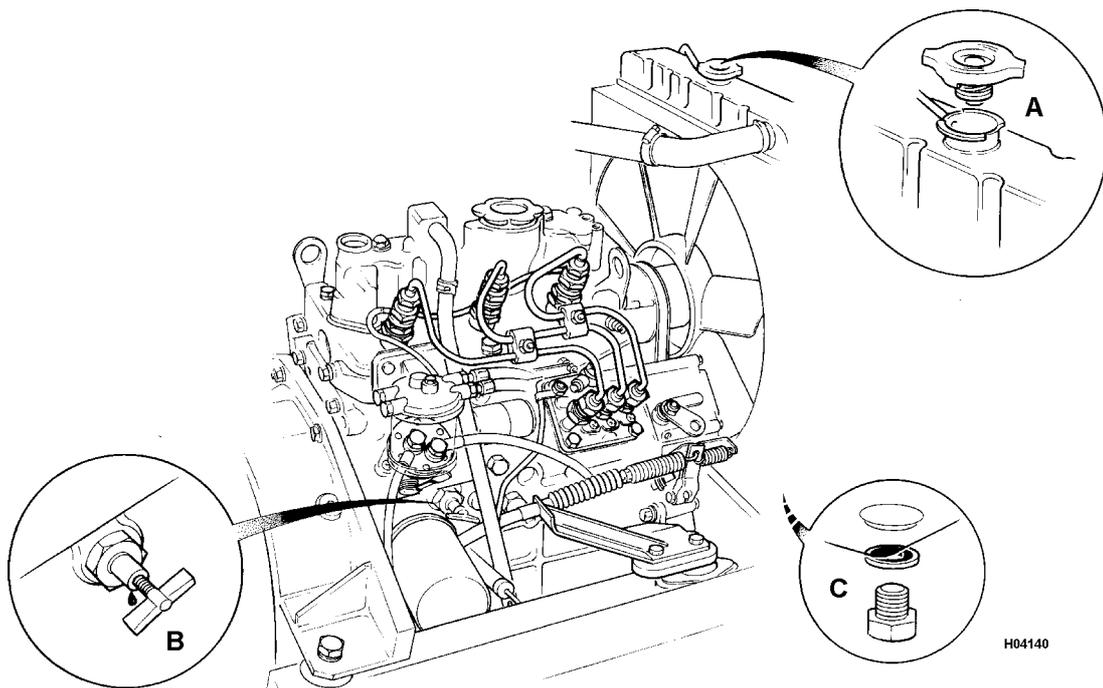
### CAUTION

Keep your face away from the cylinder block tap and the radiator drain plug when you drain the system.

#### Changing the Coolant

- 1** Do steps 1 and 2 of "Checking the Coolant level"
- 2 Drain the system**  
Undo the speed plug **B** on the cylinder block and let the coolant drain out. Remove the radiator drain plug **C** and let the coolant drain out. Make sure the drain holes are not blocked.
- 3 Flush the System if necessary**  
Use clean water
- 4 Close the Speed Plug and Refit the Drain Plug**  
Close the speed plug **B**. Make sure the drain plug **C** is clean and refit it. Make sure it is tight.
- 5 Fill the system**  
Use the necessary mix of clean, soft water and anti freeze (see Coolant Mixtures)

**Note:** A 50% antifreeze mixture is recommended even if frost protection is not needed. This gives protection against corrosion and raises the coolants boiling point.



## Cooling System - Continued

6. **Refit the Filler Cap**  
Make sure it is tight
7. **Check for leaks**  
Run the engine for a while, to raise the coolant to working temperature and pressure. Stop the engine. Check for leaks.

### \*Coolant Mixtures

The protection provided by JCB Universal Anti-freeze is shown below. If any other anti-freeze is used, refer to the manufacturers' instructions and ensure that a corrosion inhibitor is included.

**DO NOT** use solutions of more than 60% or less than 50% or damage to the cooling system will occur.

Solution	Maintains circulation down to		Protects against damage down to	
	deg. C	deg. F	deg. C	deg. F
55%	- 36	- 33	- 41	- 42

The strength of the anti-freeze solution must be checked at least once a year, preferably at the beginning of the cold period. Renew the anti-freeze every two years.

A 50% anti-freeze mixture must be used even if frost protection is not needed.

In climates where anti-freeze is not necessary, a reputable inhibitor must be used. Renew the mixture every 6 months.



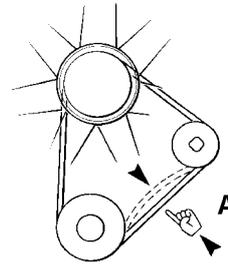
### WARNING

**Anti-freeze can be harmful. Obey the manufactures instructions when handling neat or diluted anti-freeze.**

**\*Adjusting the Fan Belt**

**Make sure that the engine cannot be started.  
Disconnect the battery before doing this job.**

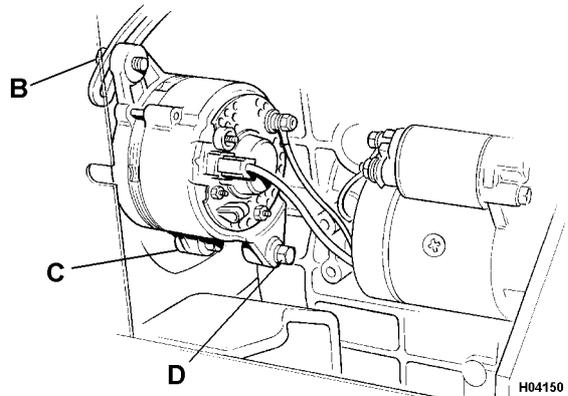
1. **Raise the Engine Cover**
2. **Check the Fan Belt Tension**  
There must be 5mm (0.2in) slack midway between the crankshaft pulley and the alternator pulley when the belt is loaded with a force of 5kgf (10lbf).
3. **Loosen the Alternator**  
Loosen the alternator mounting bolts **B**, **C** and **D**.



**IMPORTANT**  
Excessive fan belt slack can result in damage to the timing cover.

**CAUTION**

Any leverage required to position the alternator must be applied at the drive end only. Use only a wooden lever.



4. **Adjust the Fan Belt**  
Position the alternator so that there is 5mm (0.2in) slack at point **A**.
5. **Secure the Alternator**  
Tighten the alternator mounting bolts **B**, **C** and **D**, (tightening bolt **D** last).

## Torque Settings

Only use the following when no setting is specified in text of manual.

**CAUTION:** All bolts used on JCB equipment are high tensile and must not under any circumstances be replaced with bolts of a lesser tensile specification

### Metric Grade 8.8 Bolts

Bolt Size	(mm)	Hexagon (A/F) mm	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	10.0	72
M16	(16)	24	244	25.0	180
M20	(20)	30	476	48.0	352
M24	(24)	36	822	84.0	607
M30	(30)	46	1633	166.0	1205
M36	(36)	55	2854	291.0	2105

## Table Of Important Tightening Torques

### Tightening Points

Tightening Points	Tightening Torque		
	Nm	kgf m	lbf ft
Track roller	77.5 - 90.2	7.9 - 9.2	57.1 - 66.5
Idler/yoke	77.5 - 90.2	7.9 - 9.2	57.1 - 66.5
Slew ring	77.5 - 90.2	7.9 - 9.2	57.1 - 66.5
Hydraulic filter cap	Max. 30	Max. 3.1	Max. 22
Piping clamp	27.5 - 29.4	2.8 - 3.0	20.3 - 21.7
Swing pivot pin bolts	250	25.6	185
Engine shock absorber	48.1 - 55.9	4.9 - 5.7	35.4 - 41.2
Engine bracket	48.1 - 55.9	4.9 - 5.7	35.4 - 41.2
Engine support	48.1 - 55.9	4.9 - 5.7	35.4 - 41.2
Rear counterweight	98	10	72

### Rams

Head nut (all except dozer)	314	32.0	232
Head nut (dozer)	345	35.2	255
End cap (all except dozer)	610	62.2	450
End cap (dozer)	400	40.8	295

### Valve Block

Tie rod (large)	45	4.6	33
Tie rod (small)	19	1.9	14

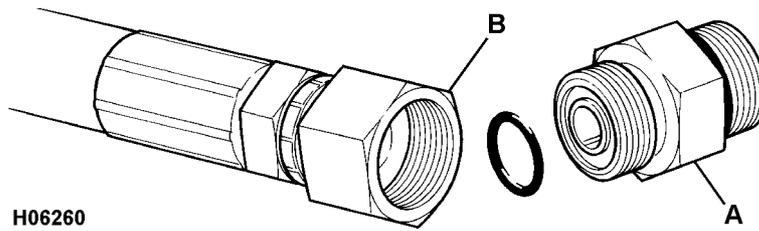
**Table Of Important Tightening Torques (cont'd)**

Tightening Points	Tightening Torque		
	Nm	kgf m	lbf ft
<b>Pump</b>			
Drive coupling	54	5.5	40
Tie bolts	44 - 52	4.5 - 5.3	32 - 38
<b>Engine</b>			
Bearing holder bolts	24 - 30	2.4 - 3.1	19 - 22
Rear plate bolts	46 - 54	4.7 - 5.5	34 - 40
Flywheel bolts	59 - 69	6.0 - 7.0	43 - 51
Connecting rod nuts	29 - 34	3.0 - 3.5	22 - 25
Suction filter bolts	10 - 12	1.0 - 1.2	7 - 9
Sump bolts	10 - 12	1.0 - 1.2	7 - 9
Sump drain plug	29 - 40	3.0 - 4.1	22 - 29
Oil pipe banjo bolts	10 - 12	1.0 - 1.2	7 - 9
Crankshaft pulley nut	117 - 127	11.9 - 12.9	87 - 94
Cylinder head bolts (oiled)	49 - 52	5.0 - 5.3	36 - 38
Injection pump bolts	10 - 12	1.0 - 1.2	7 - 9
Injection pump nut	10 - 12	1.0 - 1.2	7 - 9
Rocker arm nuts	20 - 24	2.0 - 2.4	15 - 19
Head cover nuts	10 - 12	1.0 - 1.2	7 - 9
Cooling fan bolts	10 - 12	1.0 - 1.2	7 - 9
Injector nozzle	78 - 83	8.0 - 8.5	58 - 62
Injector pipe	20 - 24	2.0 - 2.4	15 - 19
Thermo switch	24 - 29	2.4 - 3.0	19 - 22
Oil pressure switch	15 - 20	1.5 - 2.0	11 - 15
Glow plug	15 - 20	1.5 - 2.0	11 - 15
Solenoid	15 - 20	1.5 - 2.0	11 - 15
Oil pressure switch	15 - 20	1.5 - 2.0	11 - 15

### Hydraulic Fittings & Torque Settings

#### 'O' Ring Face Seal

All the hydraulic fittings on the JCB 801.4/801.5/801.6 Mini-Excavators use the 'O' ring face seal system which achieves a leak-proof, non-loosening connection.



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

#### ADAPTER (A)

SAE Tube Size	SAE Port Thread Size	A/F		Tightening Torque	
		mm	in.	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

#### OUTER SLEEVE NUT (B)

SAE Tube Size	Hose/pipe Thread Size	A/F		Tightening Torque	
		mm	in.	Nm	lbf ft
4	9/16 - 18	17.5	0.688	20 - 30	15 - 21
6	11/16 - 16	20.6	0.813	31 - 39	23 - 29
8	13/16 - 16	23.8	0.937	45 - 55	33 - 41
10	1 - 14	28.6	1.125	80 - 90	59 - 67
12	1.3/16 - 12	35.0	1.375	105 - 125	77 - 93
16	1.7/16 - 12	41.5	1.625	155 - 175	114 - 130

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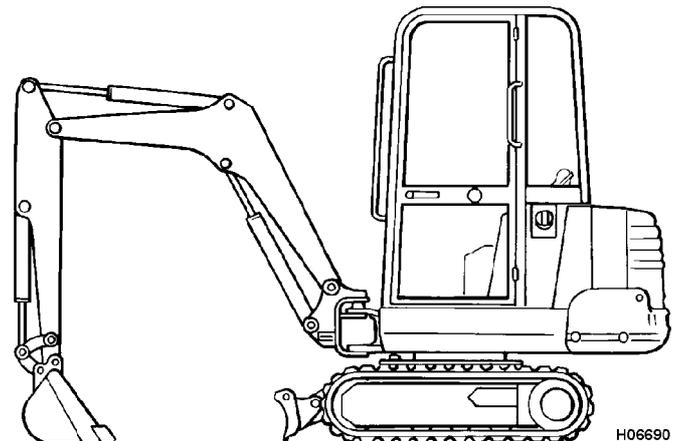
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## Bucket Dismantling and Assembly

### When Dismantling

- 1 Set up the machine in the posture shown, with the bucket lightly grounded.
  - 2 Shut down the machine and post **WARNING** notices to prevent operation during maintenance.
  - 3 Remove the lynch pin **A**. Drive out the bucket pivot pins **B**.
  - 4 Separate the bucket from the machine.
- \*5 Check the wear on the bucket teeth. Remove and renew as necessary.



### Bucket Tooth Wear

Reference value	104 mm (4.1 in.)
Allowable limit	78 mm (3.1 in.)

