

## Fastrac 3200 / 3230 Tier 4

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## General Information

Service Manual - Fastrac 3200 / 3230 Tier 4

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# Section 1 - General Information

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# Use

## Introduction

This topic contains information about the structure of the manual and how to use the manual.

⇒ [Scope \(□ 1-2\)](#)

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## Scope

### Personnel

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 this type of machine. Finally, please remember above all else SAFETY MUST COME FIRST!

### Applications

This manual contains data relevant to a range of machines. Make sure you reference the data for the correct machine.

### Newest Data

From time to time new machines, systems or devices require the manual to be re-issued. Make sure you have the newest issue.

Always check the on-line JCB data system for relevant technical information.

## Format

The manual is compiled in sections, the first three are numbered and contain information as follows:

- 1 **General Information** - general information such as torque settings and service tools.
- 2 **Care & Safety** - includes warnings, cautions and general procedures related to aspects of workshop procedures contained in the manual.
- 3 **Routine Maintenance** - includes service schedules and recommended lubricants for all the machine.

The remaining sections are alphabetically coded and deal with dismantling, overhaul etc. of specific components, for example:

- A **Attachments**
- B **Body and Framework...etc.**

The sections contain topics. Each topic is a self contained set of data about a machine SYSTEM or Device.








Each topic contains data such as specifications, descriptions, fault finding and test procedures. Device topics also contain removal, replacement, dismantle and assemble procedures.

Some topics contain **procedures and specifications for different variants**. This happens because of market requirements, or when the machine specification changes after a period of time. Where applicable, a table in the introduction of each topic contains information to help you identify the correct specifications or procedures.

## Hydraulic Schematic Codes

### Colour Codes

The following colour coding, used on illustrations to denote various conditions of oil pressure and flow, is standardised throughout JCB Service Publications.

	<b>Red</b>	<b>Full Pressure:</b> Pressure generated from operation of a service. Depending on application this may be anything between neutral circuit pressure and LSRV operating pressure.
	<b>Pink</b>	<b>Pressure:</b> Pressure that is above neutral circuit pressure but lower than that denoted by Red.
	<b>Orange</b>	<b>Pilot:</b> Oil pressure used in controlling a device (Pilot).
	<b>Blue</b>	<b>Neural:</b> Neutral circuit pressure.
	<b>Green</b>	<b>Exhaust:</b>
	<b>Light Green</b>	<b>Cavitation:</b> Oil subjected to a partial vacuum due to a drop in pressure (cavitation).
	<b>Yellow</b>	<b>Lock Up:</b> Oil trapped within a chamber or line, preventing movement of components (lock up).

# Torque Settings

## Introduction

This topic contains information about torques. Torque values are given for types and sizes of bolts and hydraulic connectors and adapters.

Where a torque is given as a single figure it may be varied by plus or minus 3%. Torque figures are given for fasteners with different surface treatments. Make sure you use the correct torque figures.

Where torques are given in topics within the other sections always use these values.

[⇒ Zinc Plated Fasteners and Dacromet Fasteners \(□ 1-8\)](#)

[⇒ Introduction \(□ 1-8\)](#)

[⇒ Bolts and Screws \(□ 1-8\)](#)

[⇒ Hydraulic Connections \(□ 1-12\)](#)

[⇒ 'O' Ring Face Seal System \(□ 1-12\)](#)

[⇒ 'Torque Stop' Hose System \(□ 1-15\)](#)

[⇒ 'Positional Type' Hydraulic Adaptors \(□ 1-16\)](#)

[⇒ Fitting Procedure \(□ 1-16\)](#)



## Zinc Plated Fasteners and Dacromet Fasteners

T11-002

### Introduction

Some external fasteners on JCB machines are manufactured using an improved type of corrosion resistant finish. This type of finish is called Dacromet and replaces the original Zinc and Yellow Plating used on earlier machines.

The two types of fasteners can be readily identified by colour and part number suffix. → [Table 1. Fastener Types \(1-8\)](#).

**Table 1. Fastener Types**

Fastener Type	Colour	Part No. Suffix
Zinc and Yellow	Golden finish	'Z' (e.g. 1315/3712Z)
Dacromet	Mottled silver finish	'D' (e.g. 1315/3712D)

**Note:** As the Dacromet fasteners have a lower torque setting than the Zinc and Yellow fasteners, the torque figures used must be relevant to the type of fastener.

**Note:** A Dacromet bolt should not be used in conjunction with a Zinc or Yellow plated nut, as this could change the torque characteristics of the torque setting further. For the same reason, a Dacromet nut should not be used with a Zinc or Yellow plated bolt.

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

**Note:** Dacromet bolts, due to their high corrosion resistance are used in areas where rust could occur. Dacromet bolts are only used for external applications. They are not used in applications such as gearbox or engine joint seams or internal applications.

### Bolts and Screws

Use the following torque setting tables only where no torque setting is specified in the text.

**Note:** Dacromet fasteners are lubricated as part of the plating process, do not lubricate.

Torque settings are given for the following conditions:

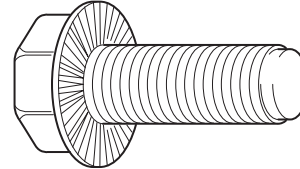
#### Condition 1

- Un-lubricated fasteners
- Zinc fasteners
- Yellow plated fasteners

#### Condition 2

- Zinc flake (Dacromet) fasteners
- Lubricated zinc and yellow plated fasteners
- Where there is a natural lubrication. For example, cast iron components

### Verbus Ripp Bolts



**Fig 1.**

Torque settings for these bolts are determined by the application. Refer to the relevant procedure for the required settings.



## Section 1 - General Information Torque Settings

Zinc Plated Fasteners and Dacromet Fasteners

**Table 2. Torque Settings - UNF Grade 'S' Fasteners**

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.0	10.0	72.3	88.0	9.0	64.9
9/16	14.3	13/16	140.0	14.3	103.2	126.0	12.8	92.9
5/8	15.9	15/16	196.0	20.0	144.6	177.0	18.0	130.5
3/4	19.0	1 1/8	343.0	35.0	253.0	309.0	31.5	227.9
7/8	22.2	1 15/16	547.0	55.8	403.4	492.0	50.2	362.9
1	25.4	1 1/2	814.0	83.0	600.4	732.0	74.6	539.9
1 1/8	31.7	1 7/8	1181.0	120.4	871.1	1063.0	108.4	784.0
1 1/4	38.1	2 1/4	1646.0	167.8	1214.0	1481.0	151.0	1092.3

**Table 3. Torque Settings - Metric Grade 8.8 Fasteners**

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	151.2	184.0	18.8	135.7
M20	20	30	400.0	40.8	295.0	360.0	36.7	265.5
M24	24	36	690.0	70.4	508.9	621.0	63.3	458.0
M30	30	46	1372.0	139.9	1011.9	1235.0	125.9	910.9
M36	36	55	2399.0	244.6	1769.4	2159.0	220.0	1592.4



## Section 1 - General Information Torque Settings

Zinc Plated Fasteners and Dacromet Fasteners

**Table 4. Metric Grade 10.9 Fasteners**

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	8.1	0.8	6.0	7.3	0.7	5.4
M6	6	10	13.9	1.4	10.2	12.5	1.3	9.2
M8	8	13	34.0	3.5	25.0	30.0	3.0	22.1
M10	10	17	67.0	6.8	49.4	60.0	6.1	44.2
M12	12	19	116.0	11.8	85.5	104.0	10.6	76.7
M16	16	24	288.0	29.4	212.4	259.0	26.4	191.0
M20	20	30	562.0	57.3	414.5	506.0	51.6	373.2
M24	24	36	971.0	99.0	716.9	874.0	89.1	644.6
M30	30	46	1930.0	196.8	1423.5	1737.0	177.1	1281.1
M36	36	55	3374.0	344.0	2488.5	3036.0	309.6	2239.2

**Table 5. Metric Grade 12.9 Fasteners**

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	9.8	1.0	7.2	8.8	0.9	6.5
M6	6	10	16.6	1.7	12.2	15.0	1.5	11.1
M8	8	13	40.0	4.1	29.5	36.0	3.7	26.5
M10	10	17	80.0	8.1	59.0	72.0	7.3	53.1
M12	12	19	139.0	14.2	102.5	125.0	12.7	92.2
M16	16	24	345.0	35.2	254.4	311.0	31.7	229.4
M20	20	30	674.0	68.7	497.1	607.0	61.9	447.7
M24	24	36	1165.0	118.8	859.2	1048.0	106.9	773.0
M30	30	46	2316.0	236.2	1708.2	2084.0	212.5	1537.1
M36	36	55	4049.0	412.9	2986.4	3644.0	371.6	2687.7



## Section 1 - General Information Torque Settings

Zinc Plated Fasteners and Dacromet Fasteners

**Table 6. Torque Settings - Rivet Nut Bolts/Screws**

Bolt Size		Nm	kgf m	lbf ft
ISO Metric Thread	mm			
M3	3	1.2	0.1	0.9
M4	4	3.0	0.3	2.0
M5	5	6.0	0.6	4.5
M6	6	10.0	1.0	7.5
M8	8	24.0	2.5	18.0
M10	10	48.0	4.9	35.5
M12	12	82.0	8.4	60.5

**Table 7. Torque Settings - Internal Hexagon Headed Cap Screws (Zinc)**

Bolt Size		Nm	kgf m	lbf ft
ISO Metric Thread				
M3		2.0	0.2	1.5
M4		6.0	0.6	4.5
M5		11.0	1.1	8.0
M6		19.0	1.9	14.0
M8		46.0	4.7	34.0
M10		91.0	9.3	67.0
M12		159.0	16.2	117.0
M16		395.0	40.0	292.0
M18		550.0	56.0	406.0
M20		770.0	79.0	568.0
M24		1332.0	136.0	983.0

### Hydraulic Connections

T11-003

#### 'O' Ring Face Seal System

##### Adaptors Screwed into Valve Blocks

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

**Table 8. Torque Settings - BSP Adaptors**

BSP Adaptor Size	Hexagon (A/F)	Nm	kgf m	lbf ft
	mm			
1/4	19.0	18.0	1.8	13.0
3/8	22.0	31.0	3.2	23.0
1/2	27.0	49.0	5.0	36.0
5/8	30.0	60.0	6.1	44.0
3/4	32.0	81.0	8.2	60.0
1	38.0	129.0	13.1	95.0
1 1/4	50.0	206.0	21.0	152.0

**Table 9. Torque Settings - SAE Connections**

SAE Tube Size	SAE Port Thread Size	Hexagon (A/F)	Nm	kgf m	lbf ft
		mm			
4	7/16 - 20	15.9	20.0 - 28.0	2.0 - 2.8	16.5 - 18.5
6	9/16 - 18	19.1	46.0 - 54.0	4.7 - 5.5	34.0 - 40.0
8	3/4 - 16	22.2	95.0 - 105.0	9.7 - 10.7	69.0 - 77.0
10	7/8 - 14	27.0	130.0 - 140.0	13.2 - 14.3	96.0 - 104.0
12	1 1/16 - 12	31.8	190.0 - 210.0	19.4 - 21.4	141.0 - 155.0
16	1 5/16 - 12	38.1	290.0 - 310.0	29.6 - 31.6	216.0 - 230.0
20	1 5/8	47.6	280.0 - 380.0	28.5 - 38.7	210.0 - 280.0

#### Hoses Screwed into Adaptors

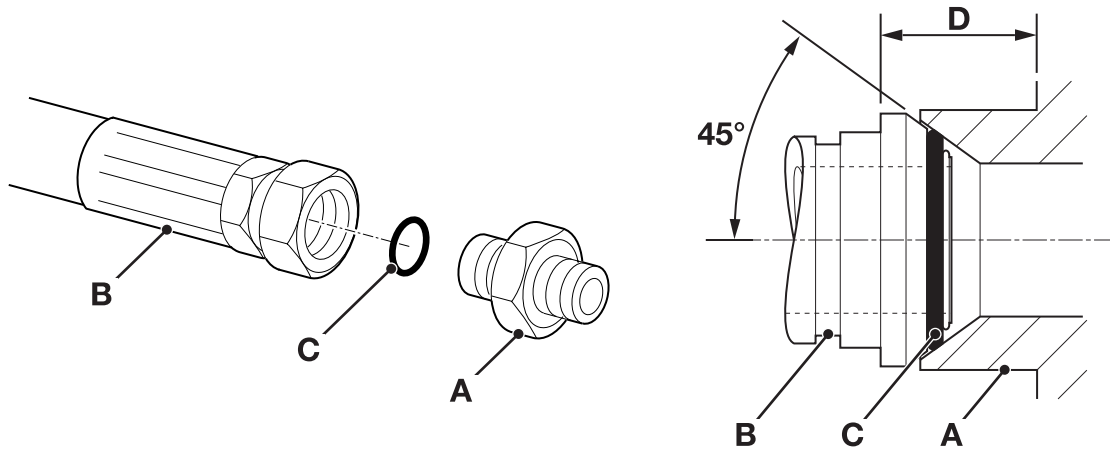


Fig 2.

Hoses **2-B** screwed into adaptors **2-A** seal onto an 'O' ring **2-C** which is compressed into a 45° seat machined into the face of the adaptor port.

**Note:** Dimension **2-D** will vary depending upon the torque applied.

Table 10. BSP Hose - Torque Settings

BSP Hose Size	Hexagon (A/F)	Nm	kgf m	lbf ft
	in.			
1/8		14.0 - 16.00	1.4 - 1.6	10.3 - 11.8
1/4		24.0 - 27.0	2.4 - 2.7	17.7 - 19.9
3/8		33.0 - 40.0	3.4 - 4.1	24.3 - 29.5
1/2		44.0 - 50.0	4.5 - 5.1	32.4 - 36.9
5/8		58.0 - 65.0	5.9 - 6.6	42.8 - 47.9
3/4		84.0 - 92.0	8.6 - 9.4	61.9 - 67.8
1		115.0 - 126.0	11.7 - 12.8	84.8 - 92.9
1 1/4		189.0 - 200.0	19.3 - 20.4	139.4 - 147.5
1 1/2		244.0 - 260.0	24.9 - 26.5	180.0 - 191.8

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