

General Information

Service Manual - 467 Wheeled Loading Shovel

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Section 1 - General Information

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Section 1 - General Information

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Introduction

About this Publication

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 earth moving 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 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 all 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 is not 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.

Where a torque setting is given as a single figure it 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 facing forwards.

This Service Manual covers the following machines:

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.

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

Black and White Codes

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



Neutral Circuit Pressure



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



Oil trapped within a chamber or line preventing movement of components (lock up).



Exhaust.



Pressure that is above Neutral Circuit Pressure but lower than that denoted by the operation of a service.



Oil pressure used in controlling a device (servo).



Oil subject to a partial vacuum due to a drop in pressure (cavitation).



Section 1 - General Information

Introduction

Schematic Codes

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Basic Operation

Moving a Disabled Machine

Introduction

P4-2025

The machine can be lifted onto a trailer for transportation. However, you **must** contact the nearest JCB Dealer before you try to tow, winch or push the machine. Towing, winching or pushing the machine without following the correct procedure can damage the transmission. If possible, repair the disabled machine where it stands.

It is not recommended to tow a disabled machine. If the machine becomes disabled, the machine must be made safe, lifted onto a transporter and moved to a location where maintenance can be carried out. If towing the machine to a safe location is unavoidable, do the procedure that follows before you try to move the machine.

Preparation for Towing

CAUTION

Towing a machine too far or too fast can damage the transmission. Do not tow the machine further than 10 Km (6 miles). Use a trailer for greater distances. When towing do not travel faster than 16 km/h (10 mph).

Use a rigid towbar. If you must use towing chains, then use two vehicles, One towing vehicle should be coupled to the front of the disabled machine. The other towing vehicle should be couple to the rear of the disabled machine, to provide braking power.

The towing vehicle(s) must have enough pulling and braking power to move and stop the machine.

4-2-5-4_2

- 1 Disengage the park brake.
- 2 Set the transmission to neutral.
- 3 Prepare the loader arm:
 - a If the engine and hydraulic systems are not damaged, lift the shovel to 900mm (3ft) above the ground, then fully 'crowd' the shovel. The machine in this position can have a straight-pull from the recovery point.

- b If the engine does not work, use the applicable equipment to lift the shovel to 900mm (3ft) above the ground and crowd the shovel. Secure the shovel in position.

Note: *The procedure for preparing the loader arm will depend on the condition of the machine and its hydraulic circuits. For this reason you should contact your JCB Dealer for help and advice before you do this task.*

- 4 Attach the drawbar (or chain) to the front chassis side plate hole (left or right).
- 5 Attach the chain to the recovery hitch (if chains are used).

Front recovery hitch **A**.

Rear recovery hitch **B**. (The rear chassis lift points)

The machine is now ready for towing. Make sure you understand what the towing driver will be doing. Obey his instructions and all relevant regulations.

Important: *Do not use the tow pin C as a recovery hitch to move the machine.*

Note: *If the machine cannot be driven due to an engine failure, the park brake must be released manually. → [Manually Release the Park Brake \(□ 1-7\)](#).*

If the steering wheel has to be turned when the machine is disabled and the engine is off, push and hold the secondary steer system switch.

When the steering wheel is being turned, the pump can be heard running and the articulation of the chassis is felt. Test the secondary steer system switch once a month.

Note: *The full operation of the steering system is only achieved when the machine is moving.*

The machines recovery hitches conform to ISO:10532. Refer to this standard to get a particular machines permitted specifications.

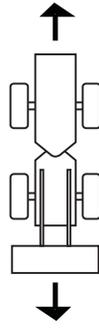


Fig 1.

T033800-2

Important: Only pull the machine in the direction of rotation of the wheels.

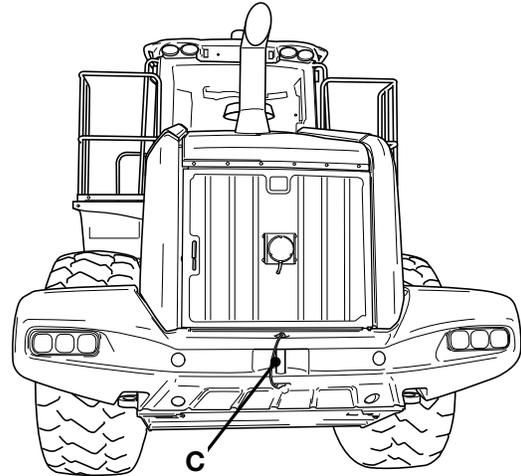


Fig 4.

C083600-1

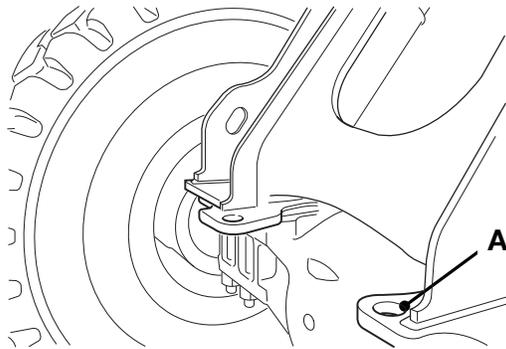


Fig 2.

C084120-C4

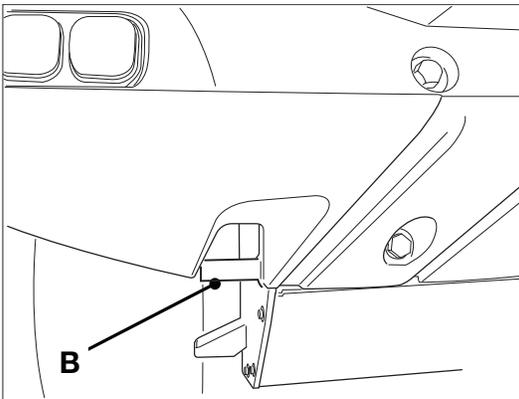


Fig 3.

C083580

Moving a Disabled Machine

Manually Release the Park Brake

The park brake is released when the engine is running and is automatically engaged when the engine is stopped. If the machine needs to be recovered due to an engine failure the park brake can be released manually.

WARNING

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

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

GEN-4-1_1

WARNING

Make sure the articulation lock is in the transport position before you transport the machine. The articulation lock must also be in the transport position if you are carrying out daily checks or doing any maintenance work in the articulation danger zone.

If the articulation lock is not in the transport position you could be crushed between the two parts of the chassis.

4-3-5-7

WARNING

Fluid Under Pressure

Fine jets of fluid at high pressure can penetrate the skin. Keep face and hands well clear of fluid under pressure and wear protective glasses and gloves. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of fluid. If fluid penetrates your skin, get medical help immediately.

INT-3-1-10_3

WARNING

Make sure the vehicle cannot be moved, as it is necessary to work under the machine to do this job.

0027

- 1 Put chocks on each side of the four wheels to stop the machine moving when the park brake is released.

- 2 Working on the right side at the front of the rear chassis, find the screwcap **A**.
- 3 Remove the screwcap **A**. → Fig 5. (□ 1-7).
- 4 Loosen the locknut **B**.
- 5 Use an Allen key to turn the adjusting-screw **C** counter-clockwise until the pads **D** are free from the brake disk **E**.
- 6 Tighten the locknut **B**.
- 7 Attach the screwcap **A** handtight.

Note: When the machine is recovered, chock the wheels to stop the machine moving.

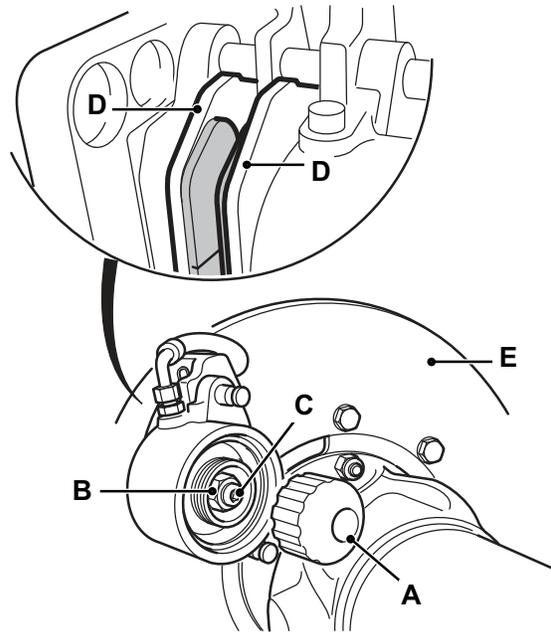


Fig 5.

A354150-V4

Transporting the Machine

WARNING

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 that you will be obeying the rules and laws of all the areas that the machine will be carried through.

Make sure that the transporting machine is suitable. See **Static Dimensions (Specifications Section)** 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 **SPECIFICATION** section for the minimum ground clearance of your machine.

2-2-7-5_1

- 1 Put the trailer in position:
 - If the machine is serviceable, use any available position.
 - If the machine is unserviceable, you must align the trailer with the rear of the machine.
- 2 Put chocks at the front and rear of the trailer wheels.
- 3 Make sure the ramps onto the trailer are in the correct position and are attached securely.
- 4 Set the loader arm to the road travel position. Refer to **Preparing for Road Travel**.
- 5 Move the machine onto the trailer:
 - a Carefully reverse a serviceable machine onto the trailer.
 - b Lift a unserviceable machine into position on the trailer.

Important: Put chocks at the front and rear of all four tyres.

- 6 Engage the park brake and set the transmission to the neutral position.
- 7 When the machine is safely in position, lower the attachment onto the trailer, then stop the engine.
- 8 Install the articulation lock. Refer to **Articulation Lock**.
- 9 Make sure that the total height of the load is within the regulations, adjust the height if necessary.
- 10 Secure the cab in position.
- 11 Put a cover on the exhaust stack.
- 12 Use the tie-down/lift points **A** to attach the machine to the trailer with chains.

Note: The tie-down labels identify the correct positions.

- 13 Measure the maximum height of the machine from the ground. Make sure the driver knows the clearance height before he drives away.

Note: If the machine cannot be driven because of an engine failure, manually release the park brake. [⇒ Manually Release the Park Brake \(1-7\)](#)

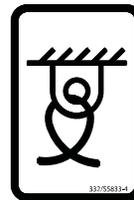


Fig 6. Tie-down labels

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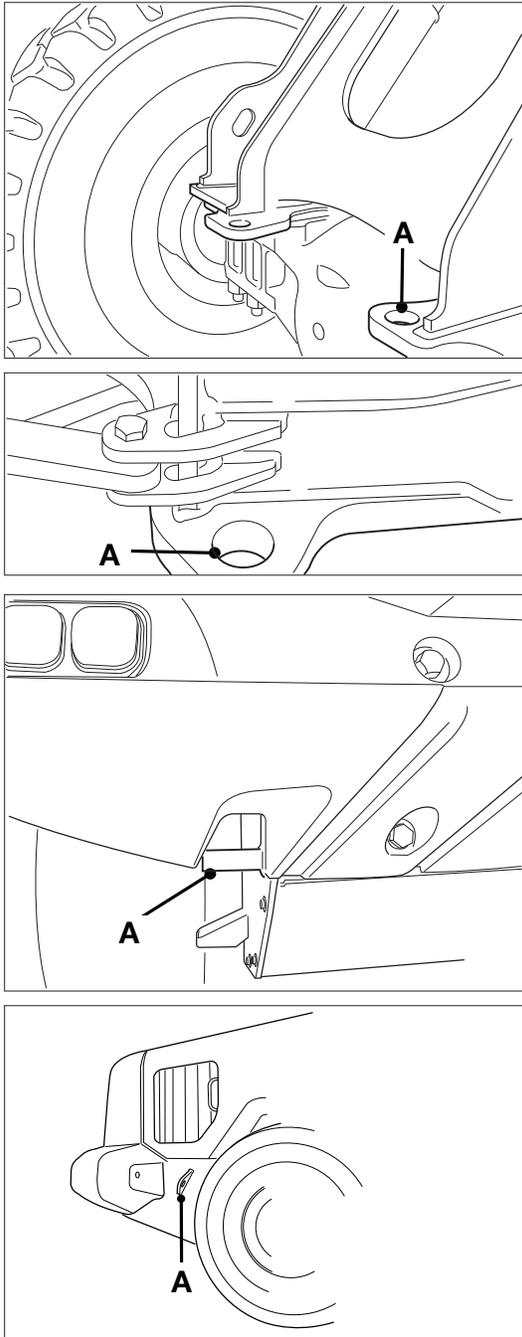


Fig 7.

C084120-C5

Articulation Lock

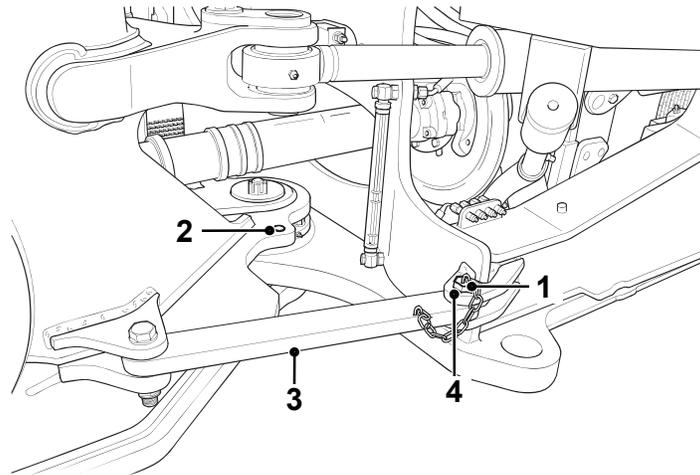


Fig 8.

C083480-1

Transport (Maintenance) Position

WARNING

Make sure the articulation lock is in the transport position before you transport the machine. The articulation lock must also be in the transport position if you are carrying out daily checks or doing any maintenance work in the articulation danger zone.

If the articulation lock is not in the transport position you could be crushed between the two parts of the chassis.

4-3-5-7

- 1 Steer the machine to put the front and rear wheels in a straight line.
- 2 Stop the machine.
- 3 Remove the locking-pin 1 from position 2 to release the articulation lock 3 from its stowed position.
- 4 Move the articulation lock 3 until the hole in the articulation lock aligns with the holes 4 in the chassis.

- 5 Put the locking-pin 1 through the holes 4 in the chassis and the articulation lock 3, to secure the articulation lock in the position shown.

If the locking-pin does not fit, turn the steering wheel slightly to align the holes.

Drive Position

WARNING

Always make sure the articulation lock has been removed before attempting to drive the machine. The machine cannot be steered with the articulation lock fitted.

16-3-1-4_2

- 1 Remove the locking-pin 1.
- 2 Move the articulation lock 3 to its stowed position.
- 3 Put the locking-pin 1 through the articulation lock 3 and position 2 to secure it in the stowed position.

Lifting the Machine

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

- 1 Lower the loader arms to the ground.
- 2 Remove all the attachments. Refer to **Attachments**.
- 3 Install the articulation lock. Refer to **Articulation Lock**.
- 4 Remove the starter key and leave the machine.
- 5 Remove all the loose equipment from the exterior of the machine.
- 6 Check the unladen weight of the machine. Refer to **Specifications**.

WARNING

Lifting Equipment

You can be injured if you use incorrect or faulty lifting equipment. You must identify the weight of the item to be lifted then choose lifting equipment that is strong enough and suitable for the job. Make sure that lifting equipment is in good condition and complies with all local regulations.

INT-1-3-7_2

- 7 Attach the lifting equipment to the sling points **A**.

Note: The sling point labels identify the correct positions.

CAUTION

When lifting the machine, a suitable spreader frame must be used to ensure the pull on each lifting point is vertical and the machine is level.

4-2-5-7

- 8 Install a spreader frame to prevent damage to the machine.
- 9 Make sure that the lifting eye is directly above the centre of gravity of the machine.
- 10 Lift the machine. Make sure the lifting equipment does not catch the machine.

DANGER

Do not stand underneath the raised load during the lowering procedure. Stand clear and to one side until the load has been safely lowered. Make sure that the area is clear of other people before lowering the load. If you do not follow these precautions you or others could be killed or seriously injured.

2-3-5-3

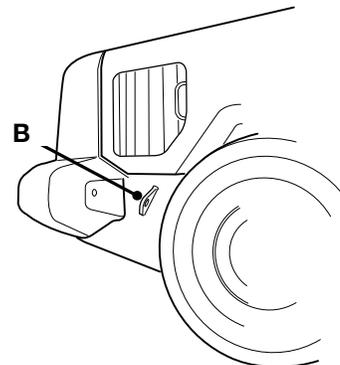
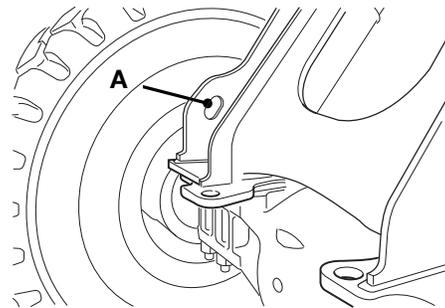


Fig 9.

C084120-3

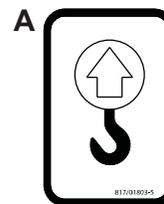


Fig 10. Sling point labels

817-01803-3



Section 1 - General Information

Basic Operation

Lifting the Machine

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Identifying the Machine

Identification Plates

Machine Identification Plate

Your machine has an identification plate **X** mounted as shown. The serial numbers of the machine and its major units are stamped on the plate.

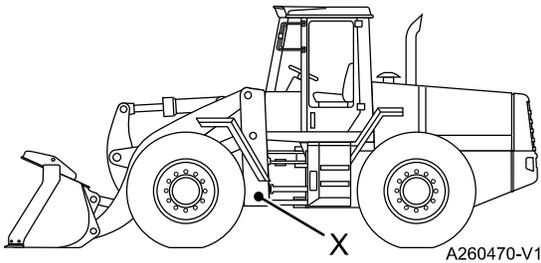


Fig 1.

The serial number of each major unit is also shown on the unit itself. If a major unit is replaced by a new one, the serial number on the identification plate will be wrong.

Either stamp the new number of the unit on the identification plate, or simply stamp out the old number.

This will prevent the wrong unit number being quoted when replacement parts are ordered.

The machine and engine serial numbers can help identify exactly the type of equipment you have.

Typical Product Identification Number

1	2	3	4	5	6
JCB	467	Z	S	D	539000

- 1 World Manufacturer Identification
- 2 Machine Model
- 3 Loader End Type
- 4 Designation
- 5 Check Letter
- 6 Machine Serial Number



Section 1 - General Information Identifying the Machine

Identification Plates

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Torque Settings

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](#) (□ 1-15).

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

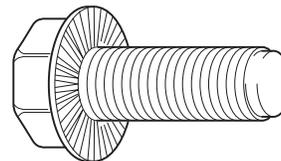


Fig 1.

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

Service Tools

Numerical List Section B - Body and Framework

The tools listed in the table are special tools required for removal and replacement of Body and Framework parts. These tools are available from JCB Service.

Note: Tools other than those listed will be required. It is expected that such general tools will be available in any well equipped workshop or be available locally from any good tool supplier.

Part Number	Description	Tool Detail Reference
826/01179	M6 x 16mm Rivet Nut	⇒ Fig 1. (□ 1-20)
826/01106	M6 x 19mm Rivet Nut	⇒ Fig 1. (□ 1-20)
826/01177	M8 x 18mm Rivet Nut	⇒ Fig 1. (□ 1-20)
826/01176	M10 x 23mm Rivet Nut	⇒ Fig 1. (□ 1-20)
826/01333	M10 x 26mm Rivet Nut	⇒ Fig 1. (□ 1-20)
892/00842	Glass Lifter	⇒ Fig 2. (□ 1-20)
892/00843	Glass Stand	⇒ Fig 3. (□ 1-20)
892/00844	Long Knife	⇒ Fig 11. (□ 1-22)
892/00846	Glass Extractor (Handles)	⇒ Fig 8. (□ 1-21)
892/00847	Nylon Spatula	⇒ Fig 4. (□ 1-20)
892/00848	Wire Starter	⇒ Fig 6. (□ 1-21)
892/00849	Braided Cutting Wire	⇒ Fig 10. (□ 1-22)
926/15500	Rubber Spacer Blocks	⇒ Fig 5. (□ 1-21)
992/12800	Cut-Out Knife	⇒ Fig 7. (□ 1-21)
992/12801	'L' Blades	⇒ Fig 9. (□ 1-22)

Tool Detail Reference Section B - Body and Framework

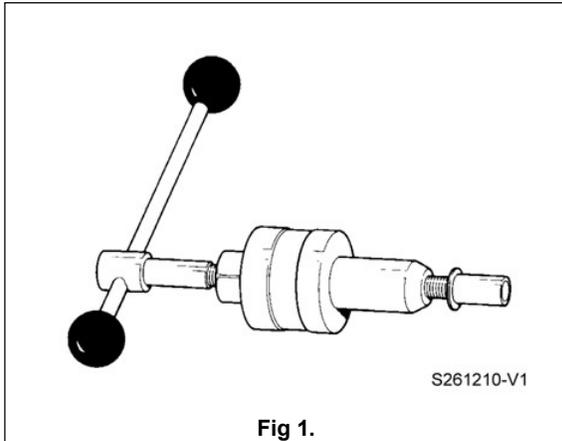


Fig 1.

Note: 826/01179 M6 x 16mm Rivet Nut, 826/01106 M6 x 19mm Rivet Nut, 826/01177 M8 x 18mm Rivet Nut, 826/01176 M10 x 23mm Rivet Nut, 826/01333 M10 x 26mm Rivet Nut

Installation Tool Available from:
 Bollhoff Fastenings Ltd.
 Midacre
 The Willenhall Estate
 Rose Hill
 Willenhall
 West Midlands, WV13 2JW

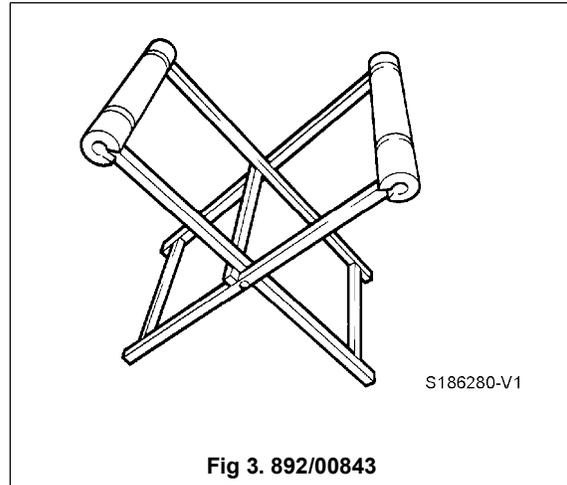


Fig 3. 892/00843

Note: essential for preparing new glass prior to installation.

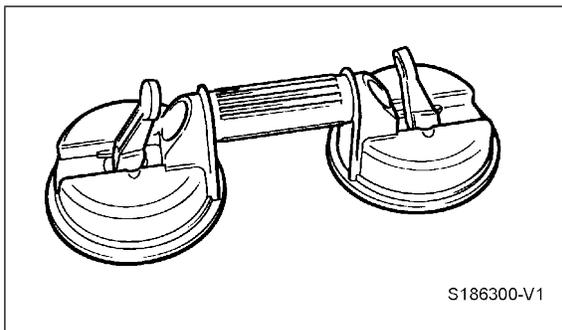


Fig 2. 892/00842

Note: - minimum 2 off - essential for glass installation, 2 required to handle large panes of glass. Ensure suction cups are protected from damage during storage.

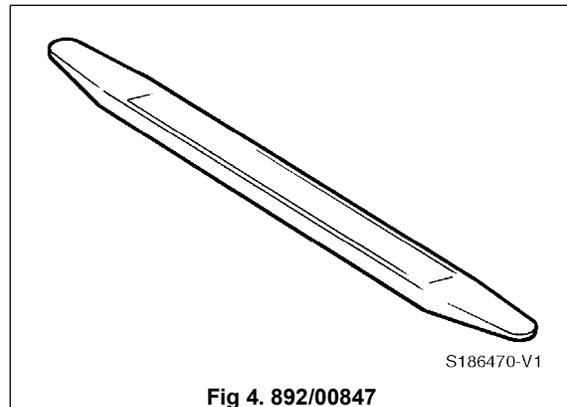


Fig 4. 892/00847

Note: - general tool used for smoothing sealants - also used to re-install glass in rubber glazing because metal tools will chip the glass edge.

