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Section B

Body & Framework

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Technical Data

General Description, Weights and Torque Settings

General Description

The excavator body and framework is of fabricated steel construction and comprises the upper structure and front attachment. The upper structure has a fabricated steel base which provides housing and mounting for the machine controls and services above and below a floor plate. The machine cab is mounted on the floor plate. The engine is mounted below the cab at the right-hand side. The front attachment comprises a bucket, dipper and boom assembly attached to the front of the upper structure through a kingpost. The front attachment pivots on the kingpost to enable left and right movement. The bucket, dipper and boom are connected through pivots which enable a full range of bucket or other attachment operations.

Weights and Dimensions

8080	kg	lb
Dipper (2000 mm)	175	285
Kingpost	200	441
Boom	350	772
Dozer Blade	346	763
Right Hand Counterweight	284	626
Left Hand Counterweight	250	551

Note: *The above weights are for individual fabricated components. When considering weight for lift purposes, an allowance must be made for the additional parts which complete each assembly.*

Major Component Torque settings

Slew ring to undercarriage (bolts must be pre-lubricated)	240 Nm	177 lbf ft

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Air Conditioning

Basic Operation

To maintain optimum operator comfort in warm climates or during seasons of high ambient temperature, the air conditioning system re-circulates, clean, dehumidified air into the cab. Cooling is provided by passing the re-circulated air, over an evaporator coil in the air conditioning unit.

The air conditioning system is a closed circuit through which the refrigerant is circulated, its state changing from gas to liquid and back to gas again as it is forced through the system.

The major components of the system are the compressor **1**, condenser **2**, receiver drier **3**, evaporator coil **5** and expansion valve **6**.

Air conditioning system power is generated from the engine, via an electromagnetic clutch to the compressor. Three switches, connected in series, are included in the clutch supply line, all must be closed for the clutch and therefore the air conditioning system to operate.

The compressor **1** draws in low pressure refrigerant gas from the suction line (evaporator to compressor) and increases refrigerant pressure through compression. This process also increases the refrigerant temperature.

High pressure refrigerant is forced from the compressor to the condenser **2** which is mounted against the engine radiator at the opposite side to the engine. Ambient air is drawn across the condenser by the engine-driven cooling fan. In the condenser, the refrigerant changes state to a high pressure, high temperature liquid but with a lower heat content.

The refrigerant passes through the receiver drier **3** which contains a desiccant to remove moisture from the system.

The receiver drier serves as a reservoir for refrigerant and also includes a filter to remove foreign particles from the system.

The high temperature, high pressure refrigerant is forced by compressor action into the expansion valve **4** which meters the amount of refrigerant entering the evaporator. In the expansion valve the refrigerant instantaneously expands to become a low pressure, low temperature liquid.

The refrigerant is drawn through the evaporator coil **5** by the suction of the compressor. The temperature of refrigerant is now considerably below that of the air being drawn across the evaporator coil by the blowers. Heat is transferred from the ambient, and re-circulated, air to the refrigerant, causing the low pressure liquid to vaporise and become a low pressure gas. Moisture in the air condenses on the evaporator coil and is drained away via condensate.

Cool de-humidified air is emitted through air vents into the cab.

The low temperature, low pressure, high heat content refrigerant gas, is now drawn by suction back to the compressor, where the cycle is completed.

Note: *In dusty conditions, it is recommended that air is re-circulated within the cab, otherwise the filter may become clogged.*

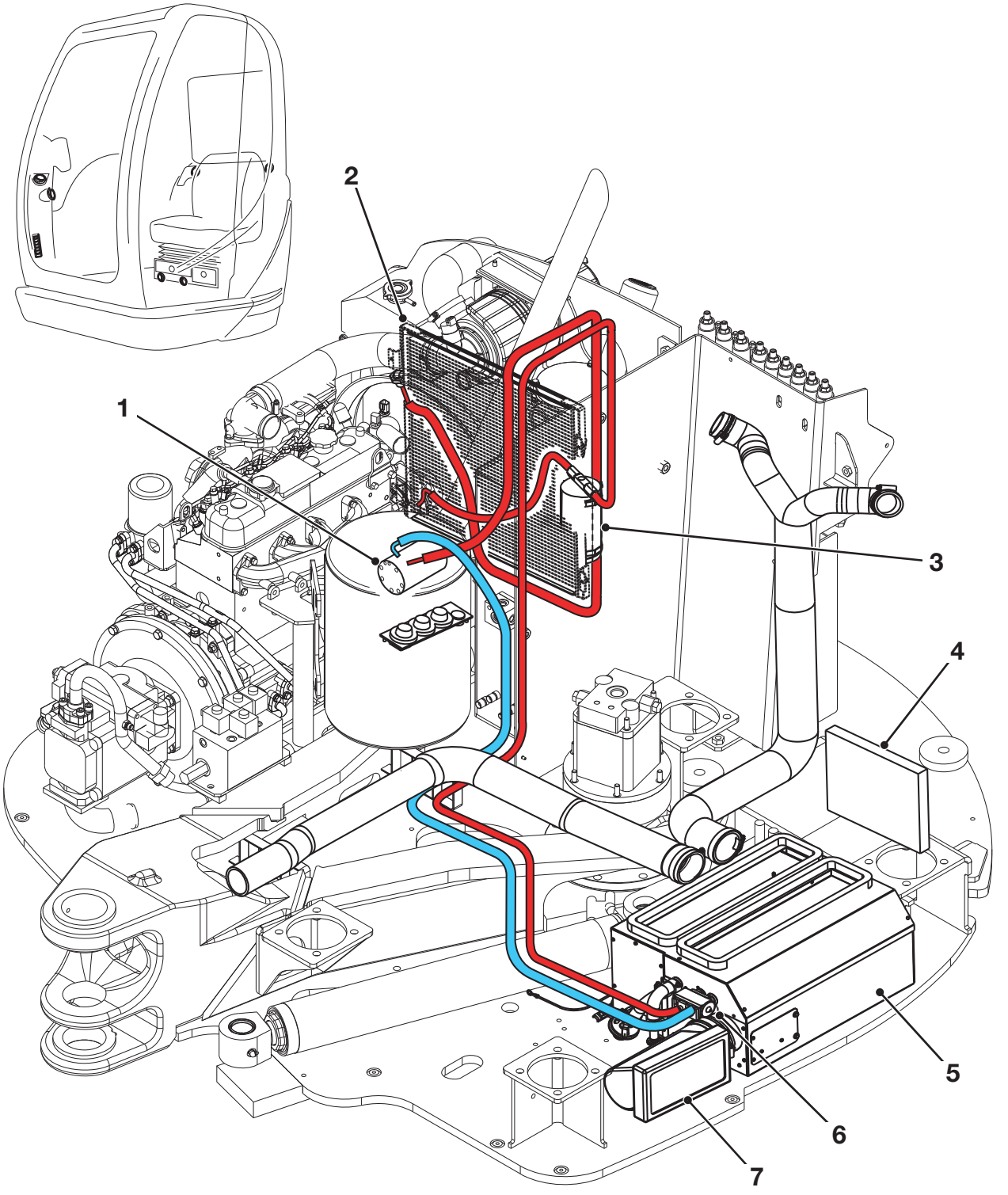

Fig 1.

1 Compressor
2 Condenser
3 Receiver/Drier
4 Air Filter
5 Evaporator Coil
6 Evaporator Valve
7 Air Filter

Heater/Air Conditioning Controls

The heater controls and heater fan controls are mounted on a console which is located at the Lower Right Side of the Cab. The air conditioning switch is on the same console.

Heater Controls

A Fan control - rotate the switch clockwise to turn on the heater fan. The volume of air from the heater increases the further the switch is rotated.

B Heat control - with the control turned fully clockwise, air flow from the heater is hot. With the control turned fully anti-clockwise air flow from the heater is cool. Settings between the two extremes result in varying temperatures.

C Ventilation control - with the control turned fully anti-clockwise, air to the heater is taken directly from outside the cab. With the control turned fully clockwise, air to the heater is drawn from inside the cab and re-circulated. Settings between the two extremes result in varying mixtures of fresh and re-circulated air.

Air Conditioning Control

D Air conditioning ON/OFF control - this push-button switch is used to select or de-select the facility. When the 'snow flake' icon is pressed, to switch air conditioning ON, the switch illuminates.

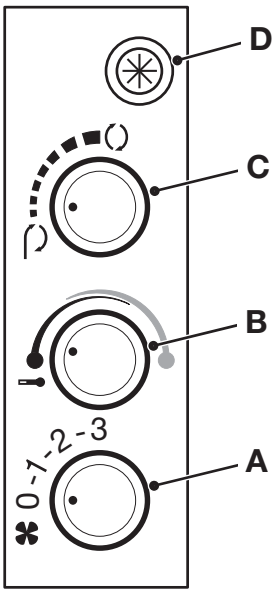

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Fig 2.

Air Distribution

Two air vents **B** are located in the cab rear panel, and three air vents **A** are located on the right hand console. Two air vents **C** are located under the driver's seat.

The vents can be adjusted to direct the air flow where required. When the vents are open, hot or cold air will flow directly into the cab.

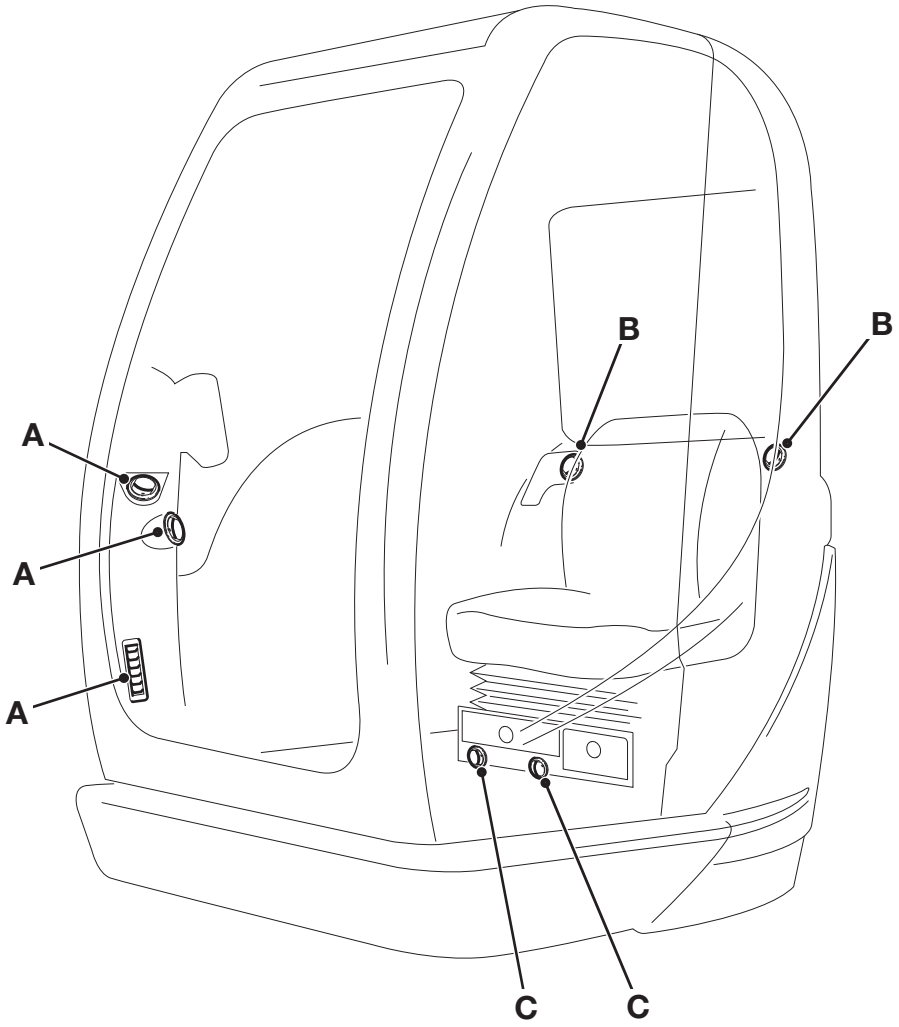

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Fig 3.

Control

Control of the system is achieved by the cyclic action of the compressor's electromagnetic clutch. When current is fed to the field coil of the compressor's clutch, a magnetic field develops between the field coil and the armature which pulls the field coil, complete with clutch assembly, onto the compressor's rotor. Because the clutch assembly is turned constantly by the crankshaft pulley drive belt, the compressor armature turns, starting the refrigeration cycle.

Current is fed to the field coil through three series switches whose contacts are controlled by the following:

1 The manual switch in the cab.

2 The thermostat switch monitoring the evaporator temperature.

3 The high and low level pressure switch.

The switch in the cab will start the refrigeration cycle provided that the ambient temperature in the cab is greater than 0°C and the refrigerant pressure remains within the specified limits.

The thermostat has its sensor inserted in the evaporator coil. It controls the refrigeration cycle by switching the compressor clutch on and off to prevent freezing of the condensate on the evaporator coil.

The pressure level switch is housed in a common assembly located on the Receiver Drier. If the refrigerant pressure exceeds the upper pressure limit specified or falls below the lower limit, the contacts will open and the clutch will disengage, closing down the refrigeration cycle.

Pressures Switch Settings

High pressure switch 28 kgf/cm^2 or 27.5 bar

Low pressure switch 2 kgf/cm^2 or 2 bar

Safety Procedures

The air conditioning system includes a pressurised, closed circuit containing a non-CFC, environmentally friendly refrigerant, Type R-134a. Any service procedure which breaks into the closed circuit and therefore requires discharging of the system, must only be carried out by service personnel with specialist knowledge of air conditioning systems. The following guidelines should be adhered to by all personnel servicing the air conditioning system.

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

⚠ CAUTION

Do not operate the air conditioning system when there is no refrigerant in the system, otherwise the compressor will be damaged.

4-3-4-4

It is critical that the correct refrigerant (R-134a) is used and that charging is done only by qualified personnel. As a precaution, in case of accidental leakage, discharging and charging of the vehicle refrigerant system must be conducted in a well ventilated area.

Containers of refrigerant should be stored in a cool environment away from direct sunlight.

⚠ WARNING

Do not carry out welding operations close to the air conditioning refrigerant circuit. A poisonous gas is produced when refrigerant comes into contact with naked flames. Do not smoke or allow naked flames close to the refrigerant circuit.

BF-1-9

Do NOT perform welding operations close to refrigerant hoses (maintain a distance of at least 0.5m from hoses).

Do NOT steam clean refrigerant system components.

When charging or discharging the refrigerant system, refrain from smoking. Naked flames must not be allowed in the immediate vicinity. The refrigerant does not give off a poisonous odour, however, when it comes into contact with a naked flame, a poisonous gas is produced.

When handling refrigerant, rubber gloves and goggles should be worn. Operators should ensure that no refrigerant comes into contact with the skin. Particular care should be taken when connecting or disconnecting charging hoses or pressure switches. When these components are connected to the system, a short release of refrigerant occurs. This results in a high velocity, very cold gas being emitted from the connection point.

Inspection

The following checks are visual inspection items that can be carried out without the need for specialist equipment or the need to open the air conditioning circuit.

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4-3-4-1_2

The visual checks are to be carried out without the engine running unless specifically stated.

Condenser

The condenser is located on top of the cab of the machine.

1 Check that the condenser is free from leaves, debris, mud or built up dirt deposits. The condenser needs to be relatively clean in order to function efficiently as a heat exchanger. If the condenser obviously needs cleaning ⇨ *Condenser (B-9)*.

2 While inspecting the condenser, check the hose connections. Condenser failure can be caused by loose hoses. Hose movement can cause a fatigue failure of the condenser tubing adjacent to the fittings. Make sure that the hoses are securely clamped.

Receiver Drier

The receiver drier is located in the engine compartment.

1 Clean the sight glass on the top housing of the receiver drier.

2 Check the sight glass, in a normal operating system the sight glass should be clear.⇨ *Sight Glass Indications (B-12)*

3 Check the hose connections to the receiver drier for signs of cracks or wear due to being insecurely clamped. Any suspect hoses should be noted and rectified only as detailed in ***Service Procedures***. Do NOT attempt to remove any hoses from a charged air conditioning system.

Compressor and Drive Belt

The compressor is mounted on a bracket secured to the engine.

1 Check that the compressor is securely mounted on its bracket and that the bracket is secure on the engine.

2 Check that the compressor clutch assembly and drive pulley are secure.

3 Check that the drive belt is in good condition. The belt should not show signs of excessive wear nor be frayed and should be correctly tensioned. Frayed or badly worn belts should be replaced. Belts that are obviously incorrectly tensioned should be adjusted. ***See Adjusting the Compressor Belt, Maintenance Section***.

4 Check the belt run between the compressor clutch pulley and the engine drive pulley. The belt run should form a straight line parallel to the engine timing cover.

Hoses and Fittings

1 Check all visible hoses and fittings. Look for places where the hoses flex or are fastened, clamped, connected, bent or pass through panels. All these places are potential wear and damage points. Any suspect hoses should be noted and rectified only as detailed in Service Procedures. Do not attempt to remove any hoses from a charged air conditioning system.

2 For any hoses that appear to require tightening ⇨ *Tightening Leaking Hoses (B-18)*

Fault Finding

Procedures that require charging or discharging the system are not given in this manual as they require special equipment that is usually held only by trained refrigeration engineers. Fault indications are given ⇨ *General Fault Indications (B-11)*

The system will not function in very low ambient temperatures, therefore tests should be carried out in a warm environment.

It is recommended that, to locate faults on the system accurately and quickly, an electronic leak detector and a refrigerant pressure gauge should be used. However, leaks can be detected on the system by using soapy water applied to the suspected leak area and system pressure can be assessed by the state of refrigerant passing through the receiver drier sight glass. The following pages of the manual deal with the major components of the air conditioning system and give further fault finding and maintenance information.

General Fault Indications

There are several indications that may help to determine the fault area on a system not working efficiently:

Table 1.

Poor performance	Low system pressure	Evacuate and recharge system
	Condenser coil air flow restricted	Remove debris from around coil using compressed air or low pressure water
	Air filters blocked	Clean with detergent and water
	Compressor drive belt too slack	Adjust to correct tension.
Warm or slightly cool air emitted from unit	Expansion valve stuck open or closed - Renew expansion valve.	
Blower does not operate	Fuse blown	Replace fuse (20A) and retest.
	Circuit faultFault	Fault find and repair.
Compressor clutch continually cuts out	Condenser coil blockage	Remove debris from around coil/renew condenser.
	Overcharging of refrigerant system	Evacuate and recharge system.
	Blocked expansion valve/condenser	Clear blocked component

Sight Glass Indications

An approximate indication of the condition of the refrigerant can be seen through the receiver/drier sight glass when the compressor is running. Refer also to ***Checking Refrigerant Charge Level***

Clear

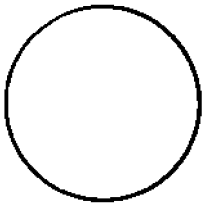


Fig 4.

No fault indicated unless the system is unable to provide cool air. The indication then is that the system is completely discharged of refrigerant.

Foam or Bubbles

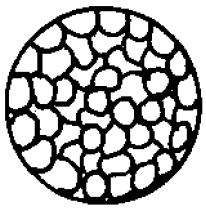


Fig 5.

Refrigerant low and in need of charging. (Some slight bubbling is to be expected when R134a refrigerant is used.)

Clear

Fig 6.

Desiccant breakdown in the receiver-drier

Note: *Sight glass indications cannot always give a positive identification of a problem. Further diagnosis, preferably by a refrigeration engineer using pressure gauges, is advisable before reaching a definite conclusion.*

Fault Finding - No Air Conditioning

1	Are the controls set correctly, i.e. air conditioning selected, thermostat switch set to coldest position and blower switched on?	YES	Check 2.
		NO	Reset controls and retest.
2	Is the air conditioning (evaporator) blower working?	YES	Check 3.
		NO	Check 4.
3	Is the compressor running (visual check of pulley/clutch)?	YES	Check 9.
		NO	Check 5.
4	Is the air conditioning fuse(s) blown?	YES	Renew fuse(s) and retest.
		NO	Check 8.
5	Is there a 12V supply to the pressure switch harness?	YES	Check 6.
		NO	Check 7.
6	Does the compressor clutch engage with pressure switch assembly bypassed?	YES	Replace pressure switch assembly.
		NO	Renew the compressor clutch and retest.
7	Does the clutch engage with thermostat switch bypassed?	YES	Renew thermostat switch and retest.
		NO	Check all electrical connections.
8	Are blower switch and wiring OK?	YES	Renew blower unit complete.
		NO	Renew switch or wiring.
9	Is sight glass indication OK?	YES	Check 10.
		NO	Charge check required by refrigeration engineer.
10	Is condenser air flow blocked?	YES	Clean condenser and radiator.
		NO	Check 11.
11	Is evaporator air-flow blocked?	YES	Clean filter and, if necessary the evaporator.
		NO	Call in refrigeration engineer.

System Diagnosis

Normal gauge readings will depend on system components and ambient conditions, make sure that the valves are closed and the readings are stable and that the system has a full charge.

The pressures on the manifold at 25 °C, with the engine a 1500 rev/min, the blower on maximum and the thermostat set to maximum, should be approximately:

Contact JCB Service for the correct pressure settings.

Typically, the high pressure is 6 - 8 times the low pressure

Normally Functioning A/C System

Gauge Readings:	
Low Side Gauge	Normal
High Side Gauge	Normal
Other Symptoms:	
Sight Glass	Clear
Discharge Air	Cold
Normal Recharge Weight:	1575 grammes

Low R-134a Charge

Gauge Readings:	
Low Side Gauge	Low
High Side Gauge	Low
Other Symptoms:	
Sight Glass	Bubbles Continuously Visible

Diagnosis

System slightly low on R-134a, due to leak or incorrect charge.

Correction:

1. Leak test system.

2. Evacuate A/C system.

3. Repair system Leaks.

4. Charge system with R-134a.

5. Operate system and check performance.

Poor Refrigerant Circulation

Gauge Readings:	
Low Side Gauge	Zero to negative
High Side Gauge	Low
Other Symptoms:	
Receiver-drier	Frost on tubes from receiver-drier to evaporator

Diagnosis

Refrigerant flow obstructed by dirt, receiver-drier clogged

Correction:

1. Evacuate A/C System.

2. Replace receiver-drier.

3. Charge System with R-134a.

4. Operate System and Check Performance.

No Refrigerant Circulation

Gauge Readings:	
Low Side Gauge	Zero to negative
High Side Gauge	Low
Other Symptoms:	
Receiver-drier	Frost or moisture on tubes before and after receiver-drier

Diagnosis

Refrigerant flow obstructed by dirt, moisture or gas leakage from expansion valve heat sensing tube.

Correction:

1. Evacuate A/C system.

2. Check heat sensing tube at expansion valve. Replace expansion valve if necessary.

3. Remove expansion valve and attempt removal of dirt. If dirt cannot be removed, replace expansion valve.

4. Replace receiver drier.

5. Charge system with R-134a.

6. Operate system and check performance.

Insufficient Cooling of Condenser or Refrigerant Overcharge

Gauge Readings:

Low Side Gauge	High
High Side Gauge	High

Other Symptoms:

Sight Glass	No bubbles visible even at lower engine speeds.

Diagnosis

Refrigerant overcharge, condenser cooling fins clogged with dirt or cooling fans malfunctioning.

Correction:

1. Clean condenser cooling fins.

2. Check cooling fan operation.

3. Evacuate A/C system.

4. Charge system with R-134a.

5. Operate system and check performance.

Air in System

Gauge Readings:

Low Side Gauge	High
High Side Gauge	High

Other Symptoms:

Sight Glass	Bubbles visible during system operation.
Pipes	Low pressure pipes are hot to the touch.

Diagnosis

Air is present in the system, possibly from inadequate evacuation procedure.

Correction:

1. Evacuate A/C system.

2. Check compressor oil for contamination. Check compressor for proper oil amount. Correct if necessary.

3. Charge system with R-134a.

4. Operate system and check performance.

Expansion Valve Improperly Mounted or Heat Sensing Tube Defective (Opening Too Wide)

Gauge Readings:

Low Side Gauge	High
High Side Gauge	High

Other Symptoms:

Pipes	Large amount of frost or moisture on low side pipes.

Diagnosis

Excessive refrigerant in low side pipes possibly from expansion valve being opened too wide.

Correction:

1. Leak test system.

2. Evacuate A/C system.

3. Repair system leaks.

4. Charge system with R-134a.

5. Operate system and check performance.

Compressor Malfunction

Gauge Readings:

Low Side Gauge	High
High Side Gauge	Low

Diagnosis

Internal compressor leak or compressor mechanically broken.

Correction:

1. Evacuate A/C system.

2. Repair or replace compressor.

3. Charge system with R-134a.

4. Operate system and check performance.

Some Moisture in the System

Gauge Readings:

Low Side Gauge	Normal, then sometimes drops to below zero.
High Side Gauge	Normal, then sometimes goes high.

Diagnosis

Moisture in system freezes, temporarily stopping cycle, normal system operation returns when ice melts.

Correction:

1. Evacuate A/C system.

2. Replace receiver drier.

3. Remove moisture by repeatedly evacuating system.

4. Charge system with R-134a.

5. Operate system and check performance.

Service Procedures

Checking Refrigerant Charge Level

The pressure in the system, i.e. the refrigerant charge level, can be determined by checking the state of refrigerant at the receiver drier sight glass. The receiver drier is mounted on the central rear counterweight, close to the air conditioning condenser.

If the level of charge is correct, the sight glass will be clear. If the charge is low, bubbles will be seen. Bubbles may also be an indication of inadequate cooling, due to a restriction of air flow around the condenser coil. (Some slight bubbling is to be expected when R134a refrigerant is used.) Recharging of the system should be carried out by an air conditioning engineer. Check refrigerant charge level as follows:

1 Park the machine on firm, level ground. Lower the excavator arms to the ground. Engage the parking brake.

2 Open the rear cover.

3 Start the engine and run at idle. Switch the air conditioning ON to circulate refrigerant.

4 Check refrigerant charge level at sight glass **A**.

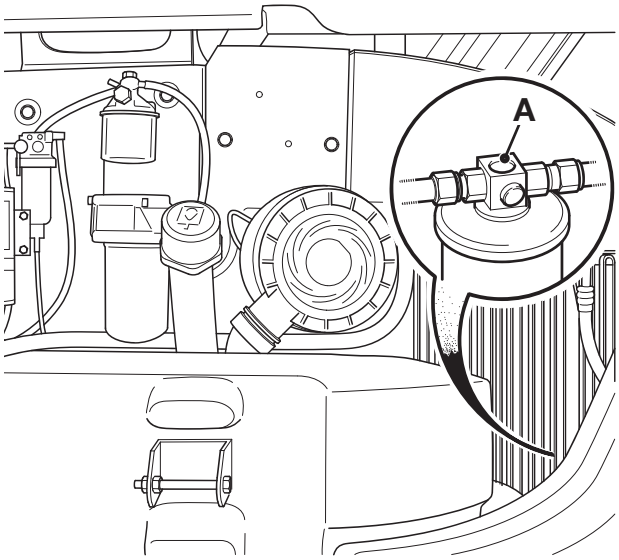


Fig 7.

Leak Testing

⚠ WARNING

Leak testing in Air Conditioning systems should be carried out only in a well ventilated area.

BF-1-2

Note: *The refrigerant is heavier than air and will leak downwards from the defective component. Check in still conditions but in a well ventilated area.*

Hose or pipe connections are likely leakage points of any refrigerant circuit.

To test for leaks in the high pressure side of the system, i.e. from the compressor output to the expansion valve, run the air conditioning for a few minutes then switch off the engine and test for leakage using an electronic leak detector or soapy water.

To test for leakage in the low pressure side of the system, switch off the air conditioning and leave for a few minutes before testing.

Tightening Leaking Hoses

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

The refrigerant hoses have crimped ferrule end fittings. The hose connectors have an 'O' ring seal which compresses when the connection is tight, creating an airtight seal.

Hoses are used to connect the inlets and outlets of the compressor, condenser, receiver drier and expansion valve (the evaporator coil is connected to the expansion valve within the air conditioning unit using rigid pipes).

If leakage is detected from a hose connector, either by means of an electronic leak detector or soapy water, tighten the connector and repeat the leakage test. If leakage is still evident, it will be necessary to de-gas the system and renew the connector 'O' ring seal.

Condenser

It is likely that over a period of time, because of the machine's working environment, the airflow around the condenser will become restricted due to a build up of airborne particles.

If the build up of particles is severe, heat dissipation from the refrigerant to the air will be significantly reduced, resulting in poor air conditioning performance.

In extreme cases, over pressurisation of the system occurs, causing the high pressure cut out switch to operate and switch off the system.

High pressure cut out can also be caused by an internal blockage of the condenser coil.

Condenser Cleaning

Take care not to damage the condenser fins or tubes. Damaged fins must be straightened to ensure a good airflow through the condenser.

The condenser is located in the rear section of the machine, fitted against the coolant radiator of the engine.

1 Position the machine on level ground and apply the parking brake. Stop the engine.

2 Remove the starter key.

3 Open the rear cover and use compressed air or low pressure water to backflow through the coil fins. Take care not to damage the fins.

4 Run the air conditioning and check cooling performance.

Cab

Direct Glazing

Direct Glazing

TB-002_5

The following procedures explain how to correctly remove and install panes of glass that are directly bonded to the cab frame apertures. When carrying out the procedures, relevant safety precautions must be taken.

1 Always wear safety glasses during both removal and replacement.

2 Use protective gloves - heavy duty leather gauntlet type gloves when cutting out the broken glass; 'non-slip' type gloves when handling/moving panes of glass; surgical type gloves when using the polyurethane adhesives.

3 Wear protective overalls.

4 Do not smoke - the activators and primers used in the procedures are highly flammable.

5 Do not attempt to handle or move panes of glass unless you are using glass lifters.

Several special tools are required to successfully complete the removal and replacement procedures. Reference is made to the tools in the text. The majority of these tools can be obtained locally and the remainder from JCB Service (see ***Service Tools***).

The work must only be carried out in a dry, frost free environment. A protective canopy may be required or the machine/frame must be moved to a sheltered area. In damp or wet conditions, hinged doors and window frames can be removed from the machine and taken to a more suitable (dry) environment.

Glass should not be replaced at temperatures below 5°C (41°F).

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

Removing the Broken Glass and Old Sealant

⚠ WARNING

Always wear safety glasses when removing or installing screen glass. Never use a power operated knife when removing the sealant around a toughened glass screen. The action of the knife could cause particles of glass to be thrown with sufficient force to cause serious injury, even when safety glasses are being worn. Use only hand operated tools when working with toughened glass.

BF-2-3_1

1 Position the machine on level ground and apply the park brake. Stop the engine. Put protective covers over the cab seat and control pedestals.

2 If a laminated pane breaks it will stay in one piece even though the glass is cracked. A toughened pane will shatter and fall apart. The method of removal of the glass depends upon which type it is.

a Laminated glass - leave installed until the old sealant has been cut away, after which it will be possible to lift the broken screen away from its frame housing in one piece.

b Toughened glass - remove as much of the shattered glass as possible prior to cutting out the old sealant.

3 Cut out the old sealant, leaving approximately 1 to 2 mm on the cab frame. There are several tools and techniques for doing this:

a Pneumatic Knife. ⇒ *Fig 1. (B-20)*. This provides one of the easiest methods of removing the sealant around laminated glass. The tool, powered by compressed air, should be sourced locally.

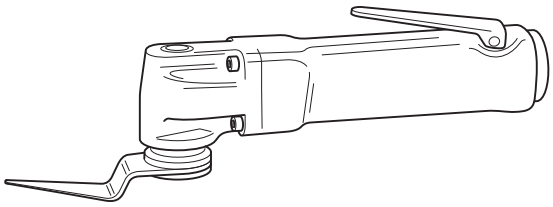


Fig 1. Pneumatic Knife

i Press the handle to start the knife blade oscillating.

Important: *This tool must not be used on toughened glass.*

ii Insert the knife blade into the sealant.

iii Slowly move the knife along the sealant with the blade positioned as close to the glass as possible. Do not allow the knife blade to overheat or the sealant will melt.

b Braided Cutting Wire and Handles. ⇒ *Fig 2. (B-20)*. This method uses a 3-core wire, a wire starter tube and two handles.

i Insert the steel tube **A** into the old sealant on the inside of the glass.

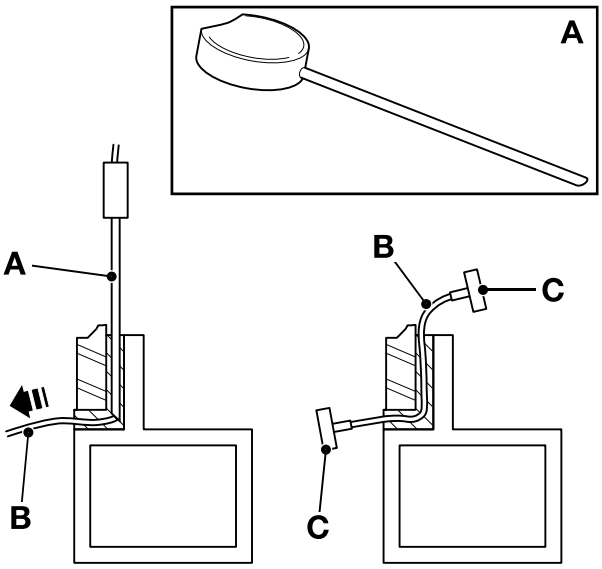


Fig 2. Braided Cutting Wire and Handles

ii Insert the braided cutting wire **B** down the centre of the steel tube. If necessary, from the outside, cut out local sealant at the point of the tube to gain access to the wire.

iii Using suitable pliers, pull the cutting wire through the sealant to the outer side of the glass.

iv Secure each end of the braided cutting wire in the special handles **C**.

v Move the cutting wire backwards and forwards in a sawing motion and at the same time gently push or pull the wire to cut through the old sealant.

c Cut-out Knife. ⇒ *Fig 3. (B-21)*. The cut-out knife can be used as a left handed or right handed tool.

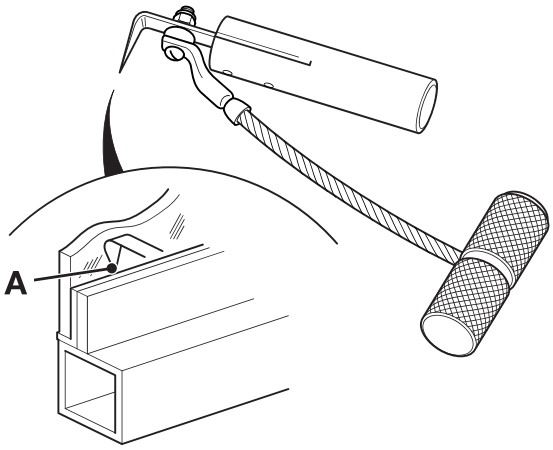


Fig 3. Cut-out Knife

i Insert the knife blade into the sealant.

ii Make sure that the blade of the knife is against the glass **A**. ⇒ *Fig 3. (B-21)*.

iii Use the 'pull-handle' to pull the knife along and cut out the old sealant.

d Craft Knife. ⇒ *Fig 4. (B-21)*. The blades **A** are replaceable.

i Insert the knife blade into the sealant.

ii Pull the knife along and cut out the old sealant.

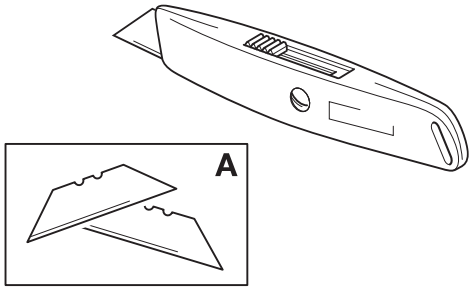


Fig 4. Craft Knife

4 Laminated glass - lift out the broken pane using glass lifters.

Toughened glass - remove the cut off sealant and all remaining particles of shattered glass.

5 If necessary, trim off the remaining old sealant to leave approximately 1 to 2 mm on the upright face of the cab frame aperture. ⇒ *Fig 5. (B-21)*.

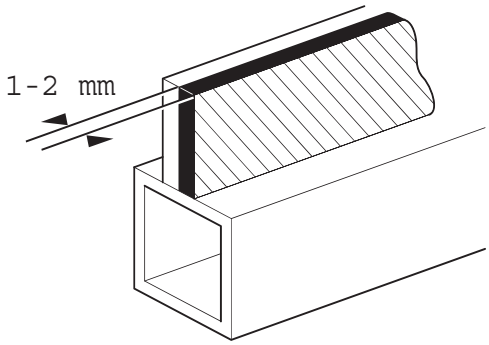


Fig 5.

6 Apply a coat of 'Black Primer 206J' to the paintwork if:

a Paintwork was damaged or scratched during the glass/sealant removal procedures.

b The old sealant was inadvertently cut back to the cab frame during the glass/sealant removal procedures.

Preparing the Cab Frame Aperture

1 If damp or wet, dry the aperture area using a hot air gun (sourced locally).

2 Use 'Active Wipe 205' to thoroughly clean and 'prime' the trimmed sealant. Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: *Do not use any other type of cleaning fluids, otherwise they may be absorbed into the old sealant and ultimately prevent the new glass from bonding.*

Preparing the New Glass

⚠ WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

1 Make sure that the new glass correctly fits the frame aperture **A**. ⇒ *Fig 6. (B-22)*.

a Put two spacer blocks **B** onto the bottom part of the frame aperture.

b Install the new glass on the spacer blocks - Always use glass lifters **C**. Check that there is an equal sized gap all round the edge of the glass.

Note: *The spacer blocks are rectangular in section to give two common gap widths. If necessary they can be trimmed to a smaller size to give an equal sized gap around the glass.*

Important: *The glass edges must not touch the frame, otherwise movement of the frame will chip and eventually break the newly installed glass.*

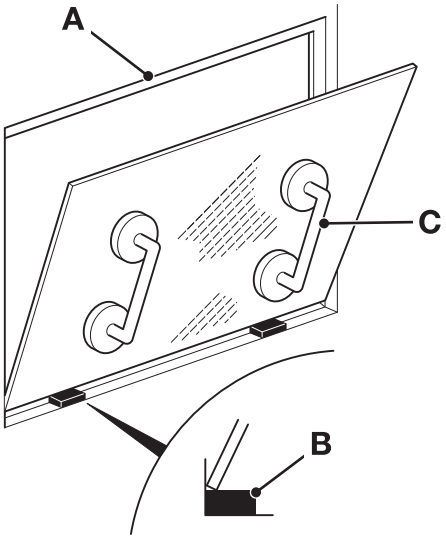


Fig 6.

2 After checking for size, remove the new glass and place it on a purpose made glass stand. ⇒ *Fig 7. (B-22)*.

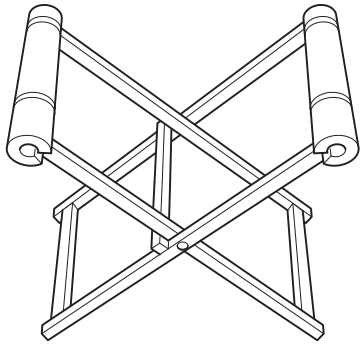


Fig 7. Glass Stand

Small panes of glass will need locating on a 600 x 700 mm x 15 to 19 mm thick plywood board, sourced locally to fit the glass stand. ⇒ *Fig 8. (B-22)*. It is recommended that an access hole is cut in the board to accommodate the glass lifter, making it easier and safer to handle small panes of glass. The board should be covered with felt or carpet to give an anti-scratch surface. Resting the glass on four spacer blocks will ensure clearance of the cartridge nozzle tip during application of the polyurethane sealant.

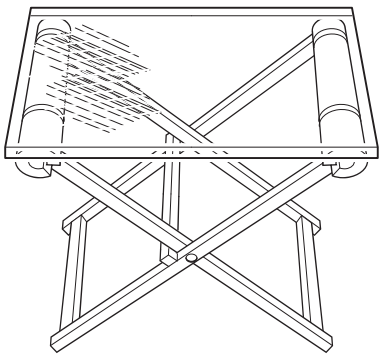


Fig 8.

3 Make sure the glass is positioned on the stand the correct way up (i.e. with the black ceramic ink band upwards) ready for application of primer etc.

4 Clean the glass

a Use 'Active Wipe 205' to thoroughly clean and 'prime' the black ceramic ink band printed on the glass (see ***Note***). Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: *Do not touch the glass after cleaning with the 'Active Wipe 205'.*

b If the glass does not have a black ceramic ink band, paint a band on the glass using 'Black Primer 206J'. The band should be approximately 25mm (1in) wide, and the edge should be a neat straight line. ⇒ ***Fig 9. (B-23)***.

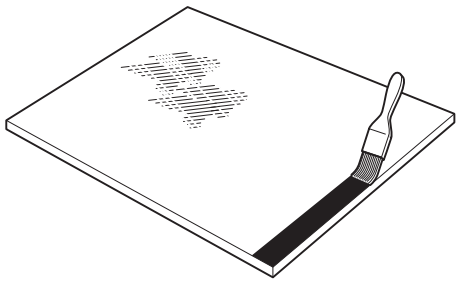


Fig 9.

5 Install the Ultra Fast Adhesive cartridge (see ***Sealing and Retaining Compounds***, Section 1 and ***Note***) into a suitable applicator gun:

a Remove the aluminium disc cover from the base of the cartridge and discard the 'dessicant capsule'.

b Make sure that the rolled edge of the cartridge is not damaged - if necessary, the edges should be pressed flat, otherwise it will be difficult to remove the cartridge from the applicator gun.

c Pierce the front 'nozzle' end of the cartridge to its maximum diameter.

d Fit the pre-cut nozzle. ⇒ ***Fig 10. (B-23)***.

e Install the cartridge in the applicator gun.

Note: *Cold material will be very difficult to extrude. The cartridges must be pre-heated in a special oven for 1 hour to a temperature of 80°C (176°F). Pre-heating the cartridges makes the adhesive more workable and also brings the 'curing' time down to 30 minutes.*

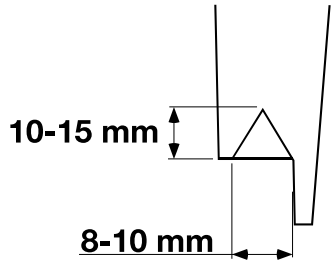


Fig 10.

6 Apply the pre-heated adhesive to the glass (do not start in a corner). Keep the nozzle guide **A** against the edge of the glass and make sure that the adhesive forms a continuous 'pyramid' shape. ⇒ ***Fig 11. (B-23)***

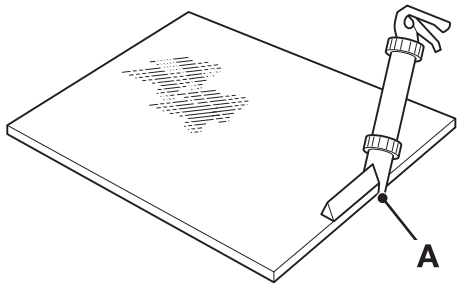


Fig 11.

Note: *Once the pre-heated adhesive has been applied to the glass, install the glass in the aperture as soon as possible. After approximately 10 minutes the sealant will form a 'skin', this will prevent the glass from bonding.*

7 After applying the adhesive, leave a small amount of sealant protruding from the nozzle. This will prevent any adhesive left in the cartridge from 'curing'.

Installing the New Glass

1 If the internal trim strip is damaged, renew it (cut to length as required) before fitting the new glass. Make sure the two spacer blocks are in position. ⇒ ***Preparing the New Glass (B-21)*** - step 1.

2 Install the glass in the frame aperture:

a Always use the special lifting tools when moving the glass. Use a lifting strap to hold large panes of glass in position. ⇒ ***Fig 12. (B-24)***.

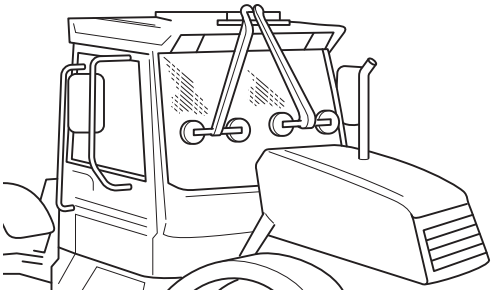


Fig 12. Typical M/c. Installation

b Sit the bottom edge of the glass on the spacer blocks. ⇒ *Fig 13. (B-24)*

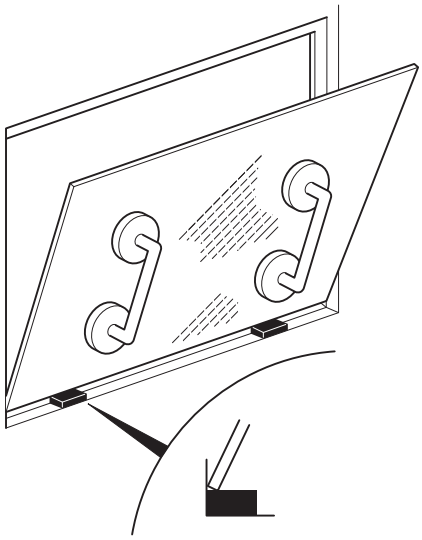


Fig 13.

c Make sure that the glass is correctly positioned, then gently press around the edges of the glass and ensure full adhesive contact is achieved. Do not press too hard or too much adhesive will squeeze out.

3 Make the inside seal smooth:

a Wearing surgical gloves, dip your finger in a soapy water solution.

b Use your finger to make the inside seal smooth.

4 All exposed edges must be sealed using Black Polyurethane Sealant (see ***Sealing and Retaining Compounds***, Section 1).

Important: *Use extreme caution when wiping the inside of the new glass - pushing too hard on the inside of the glass will affect the integrity of the bonded seal.*

5 Clean the glass after installation:

a Small amounts of sealant can be cleaned from the glass using the 'Active Wipe 205'.

b Large amounts of excess sealant should be left to 'cure' and then cut off with a sharp knife.

Note: *On completion of the glass replacement procedures, the sealant 'curing' time is 30 minutes. This means that the machine can be driven and used after 30 minutes, but it must not be used during the curing period of 30 minutes.*

c Clean the glass using a purpose made glass cleaner

6 On completion of the glass installation procedures tidy the work area:

a Remove all broken glass from the cab area.

b Remove the protective covers from the cab seat and control pedestals.

c Renew all safety and instructional labels so that the new installation conforms with the original cab installation.

Upper Structure

Removal and Replacement

Removal

Note: *The upper structure includes all equipment and structure located above the track and running gear with the exception of the front end attachment.*

1 Remove the excavator assembly.

2 Disconnect the earth lead and remove the battery.

3 Remove the engine cover and remove the engine.

4 Remove the rear cover and the outer counterweights.

5 Drain and remove the fuel tank.

6 Release the pressure cap on the hydraulic tank to relieve system pressure and prevent the risk of injury due to high pressure oil.

⚠ CAUTION

The hydraulic oil filler cap may be hot if the machine has recently been used. If this is the case, wear suitable gloves when tightening or loosening this cap.

0119

7 Disconnect all electrical cables and hydraulic pipes to the hand controllers.

8 Disconnect the instrument panel electrical cables.

9 Remove the cab.

10 Remove the seat/seat base with dozer lever.

11 Remove the cab floor.

12 Drain the hydraulic system. Remove the hydraulic pipework.

13 Remove the hydraulic tank, if necessary.

14 Remove the valve block, if necessary.

15 If necessary, remove the air conditioning unit, the condenser, the receiver drier and associated pipework. Before removal, the refrigerant must be drained from the system by a qualified air conditioning specialist.

16 Remove the slew motor.

17 Remove the hydraulic hoses from the rotary coupling.

18 Remove the plate which prevents the rotary coupling reaction pin from rotating. Do not rotate the rotary coupling after this operation.

19 Attach lifting equipment to the upper structure frame. Remove the bolts **A** which secure the upper structure frame to the slew ring ⇨ *Fig 1. (B-26)*. Lift the upper structure frame clear of the machine. Take care not to foul the rotary coupling. There is a small 'cut-out' in the upper structure to allow for the reaction pin on the coupling. Take care that there is no fouling during removal.

20 Remove the rotary coupling, if necessary.

21 Remove the bolts **C** which secure the slew ring **B** to the machine undercarriage.

22 Remove the slew ring from the machine.

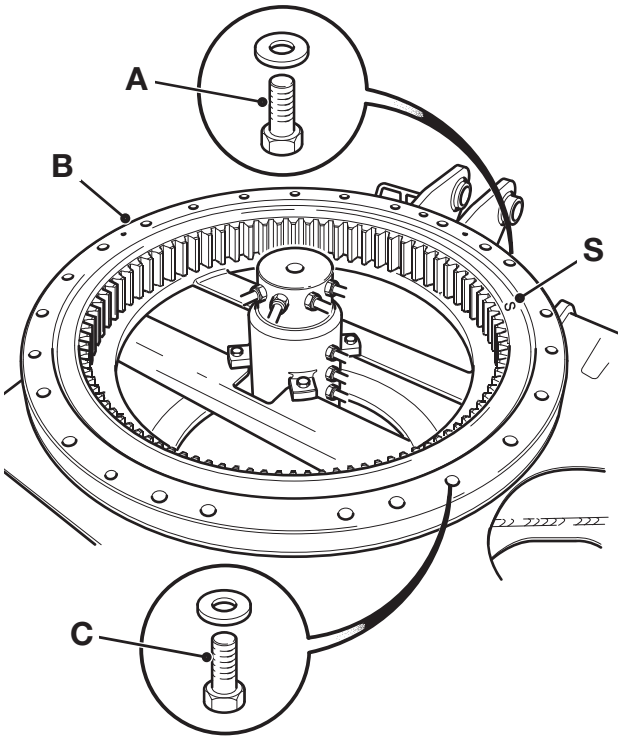


Fig 1.

Replacement

The replacement is the reverse of the removal procedure, except refer to the following important points:

When installing the slew ring on the undercarriage, ensure that the 'soft spot' (marked 'S') is towards the front right-hand side, i.e. at 45º to the machine, as shown **S**.

When installing the upper structure, do not damage the rotary coupling. Be aware of the cut-out referred to in step 18 above.

Ensure that the dowels are fitted between the slew ring and the upper structure.

The refrigerant of the air conditioning system must be refilled by a qualified air conditioning specialist.

Restore the hydraulic fluid level and check the operation of the hydraulic circuit.

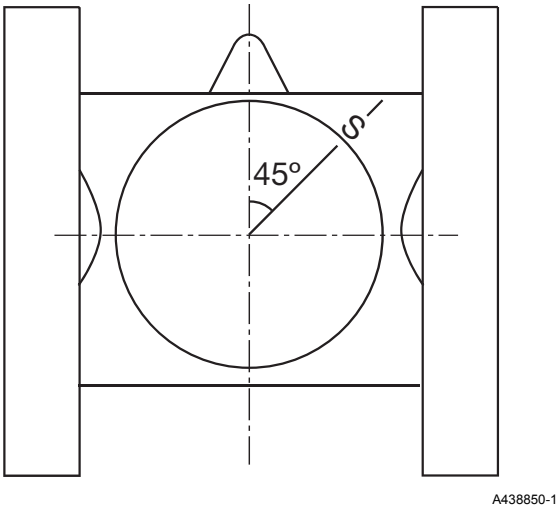


Fig 2.

Bucket Ram Pivot and Linkage

Removal and Replacement

Removal

1 Remove the bucket.

2 Remove the self-locking nuts **A** and bolts **B** from both pivot pins **C**. Support the links **D** and **E** and drive out both pivot pins **C**. Retract the piston rod end of the bucket ram **F** clear of the link **D**. Remove the links **D** and **E**.

3 Clean all old grease from the links **D** and **E** and pivot pins **C**.

Inspection

Check the link bushes and the pivot pin for wear or damage. Renew pivot pin and/or remove and replace link bushes as necessary.

Replacement

⚠ WARNING

Do not use your fingers through the holes to align the links.

8-2-9-32

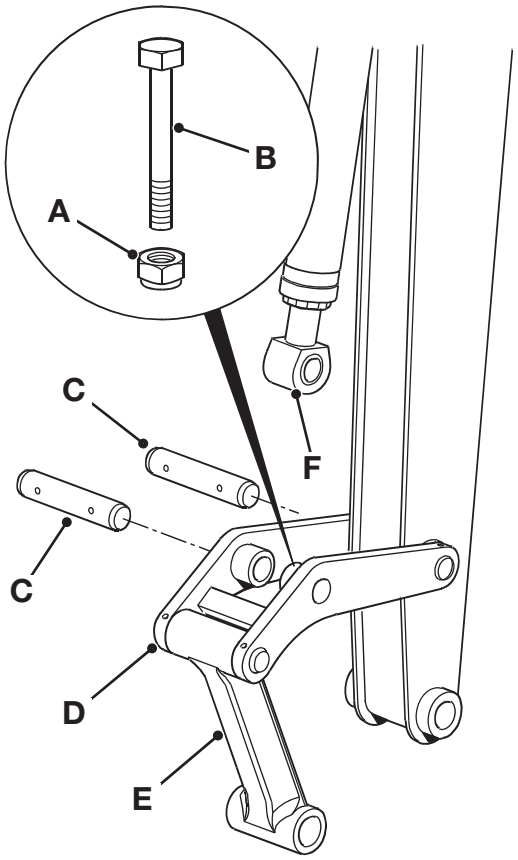
Note: *Refer to Section 3 for grease specification.*

1 Grease the pivot pins **C**.

2 Locate the fork end of the link **D** into the dipper, the correct way up as shown. Fit the pivot pin **C** through both sides of the link and dipper. Secure using bolt **B** and a new self-locking nut **A**.

3 Locate the rod end of the bucket ram **F** into the fork of the link **E**. Fit the pivot pin **C** through both links and the ram end. Secure using bolt **B** and a new self-locking nut **A**.

4 Grease the linkage through the grease nipple on the ram end boss.



A437520-1

Fig 1.

Dipper

Removal and Replacement

Removal

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

1 Lower the boom and dipper **J** to a suitable position to allow access to the parts shown.

2 Remove the bucket and links.

3 If necessary, remove the bucket ram. Release the pressure cap on the hydraulic tank to relieve system pressure and prevent the risk of injury due to high pressure oil.

⚠ CAUTION

The hydraulic oil filler cap may be hot if the machine has recently been used. If this is the case, wear suitable gloves when tightening or loosening this cap.

0119

4 Disconnect the relevant hydraulic hoses; fit blanking caps to the open connections.

5 Remove the self-locking nut **A** and bolt **B**. Drive out the dipper ram pivot pin **C**. Separate the dipper ram eye end **E** from the dipper pivot **D**. Position a piece of timber to support the dipper ram eye.

⚠ WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

6 Attach suitable lifting equipment to the pivot pin location of the dipper **D** and support the dipper.

7 Remove the self-locking nut **F** and the bolt **H**. Drive out the pivot pin **G**.

8 Use suitable lifting equipment to remove the dipper from the machine.

9 Clean all old grease from the pivot pins and bushes.

Inspection

Inspect the dipper pivot bushes and pivot pin for wear or damage. Renew pivot pin and/or dipper pivot bushes as necessary.

Examine the boom structure for wear, damage or corrosion. Renew as necessary.

Replacement

1 Apply grease to the pivot pins **G** and **C**.

2 Use suitable lifting equipment to locate the dipper **J** in the boom.

3 Fit the pivot pin **G** and secure with the bolt **H** and a new self-locking nut **F**.

4 Locate the end of the dipper ram **E** into the dipper pivot **D**. Fit the pivot pin **C** and secure with the bolt **B** and a new self-locking nut **A**.

5 Remove the blanking caps and reconnect the hydraulic hoses

6 Fit the bucket ram.

7 Fit the bucket.

8 Grease the pivot pins at the grease nipples on the ram ends.

9 Restore the hydraulic fluid level and check the operation of the hydraulic circuit.

⚠ WARNING

Do not use your fingers through the holes to align the links.

8-2-9-32

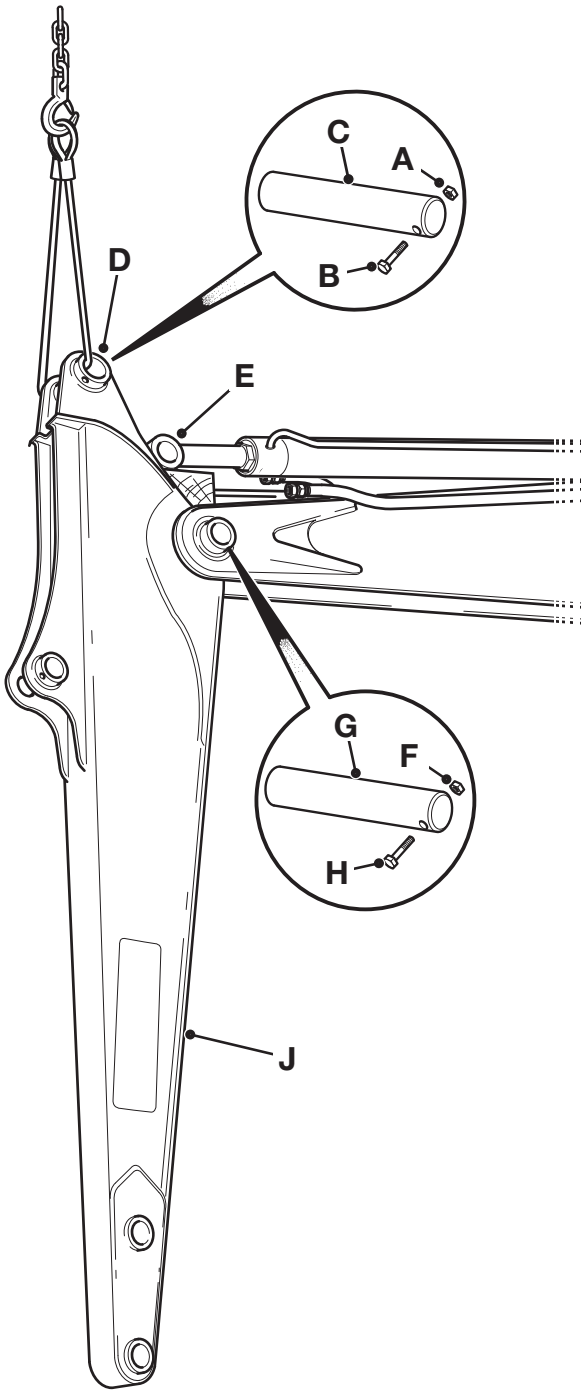


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Fig 1.

Boom

Removal and Replacement

Removal

⚠ WARNING

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

INT-3-1-11_2

⚠ WARNING

Do not use your fingers through the holes to align the links.

8-2-9-32

1 Lower the boom and dipper to a position where the parts shown are accessible.

2 Remove the bucket and links.

3 Remove the dipper.

4 Release the pressure cap on the hydraulic tank to relieve system pressure and prevent the risk of injury due to high pressure oil.

⚠ CAUTION

The hydraulic oil filler cap may be hot if the machine has recently been used. If this is the case, wear suitable gloves when tightening or loosening this cap.

0119

5 Remove the dipper ram.

6 Disconnect the hydraulic hoses near the base of the boom. Blank off the open ends of the hoses and pipes. Fold the hoses clear of the boom.

7 Disconnect the working light harness.

8 Position a wooden block to support the ram. Remove the self-locking nut **B** and withdraw the bolt **A**. Drive out the pivot pin **C** and lower the boom ram onto the wooden block.

9 Attach suitable lifting equipment to the boom and take up the slack.

⚠ WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

10 Remove the nut and bolt. Drive out the pivot pin. Carefully remove the boom from the machine.

Inspection

Inspect the seals at each side of the boom pivot bushes. Replace if worn or damaged.

Inspect the boom pivot pin and bushes for wear or damage. Renew the pin or bushes as necessary.

Examine the boom structure for wear, damage or corrosion. Renew as necessary.

Replacement

1 Grease the pivot pins.

⚠ WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

2 Using suitable lifting equipment locate the boom onto the kingpost.

3 Fit the pivot pin **C** and secure with the bolt **A** and a new self-locking nut **B**.

4 Fit the boom and dipper rams.

5 Fit the dipper, bucket link and bucket.

6 Connect the hydraulic hoses to the pipes on the boom. Reconnect the working light harness.

7 Restore the hydraulic fluid level and check the operation of the hydraulic circuit.

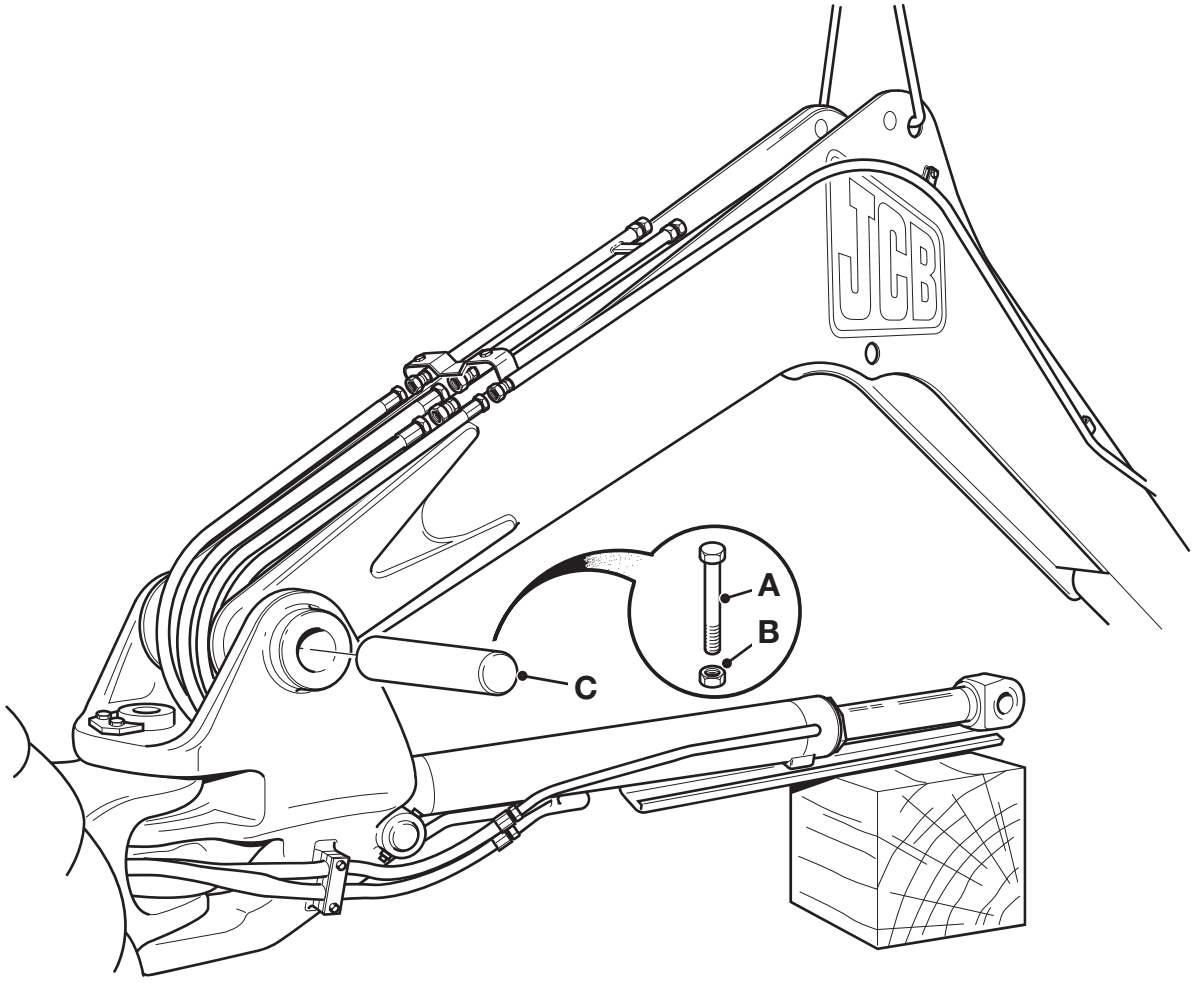


Fig 1.

Kingpost

Removal and Replacement

Removal

1 Remove the dipper, the boom and the boom ram (see relevant pages).

2 Remove the double hose clamp **F** from the right side and open the large hose clamp **B** near the top of the kingpost **A**.

3 Make a note of the positions and routes taken by the hydraulic hoses and the harness for the boom working light, then release the main hose clamp **B**.

4 Remove the swing ram locking plate **K** and drive out the pivot pin **J**. Move the ram away from the kingpost.

⚠ WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

5 Support the weight of the kingpost with suitable lifting equipment.

6 Remove the upper pivot pin locking plate **D** and drive out the upper pivot pin **C** in an upward direction.

7 Remove the lower pivot pin locking plate **G** and drive out the lower pivot pin **H** downwards.

8 Carefully lift the kingpost away from the carrier; feed the hoses and boom working light harness through the kingpost. Collect the thrust washer **E** from the top of the mainframe; note its position.

Inspection

Inspect the kingpost, the swing ram and boom ram pivot bushes and pivot pins for wear or damage. Renew the pivot pins and/or pivot bushes as necessary.

Examine the kingpost structure for wear, damage or corrosion. Renew as necessary.

Replacement

⚠ WARNING

Do not use your fingers through the holes to align the links.

8-2-9-32

1 Clean paint and loose scale from the pin abutment area on the kingpost pivot pin (kingpin) and from the kingpost abutment areas.

2 Using suitable lifting equipment, locate the kingpost on the carrier. Make sure that the hoses are correctly routed through the kingpost and are then fitted to their original positions in the hose clamp. Make sure that the thrust washer is inserted at the correct position: between the top of the carrier and the kingpost.

3 Apply grease to pivot pins **H**, **C** and **J** and also to the pivot pin bores. Use JCB HP grease.

4 Fit the lower pivot pin **H**. Fit the locking plate **G**.

5 Fit the upper pivot pin **C** and fit the locking plate **D**.

6 Tighten the setscrews which retain the locking plates **D** and **G** to a torque of 115 Nm (85 lbf ft).

7 Apply JCB HP grease the swing ram pivot pin **J** and to the its bore in the kingpost. Align the eye of the swing ram with the kingpost bore and fit the pivot pin **J**. Fit the locking plate **K** and tighten the setscrews to a torque of 47.5 Nm (35 lbf ft).

8 Fit the boom and dipper (see relevant pages). Connect the working light.

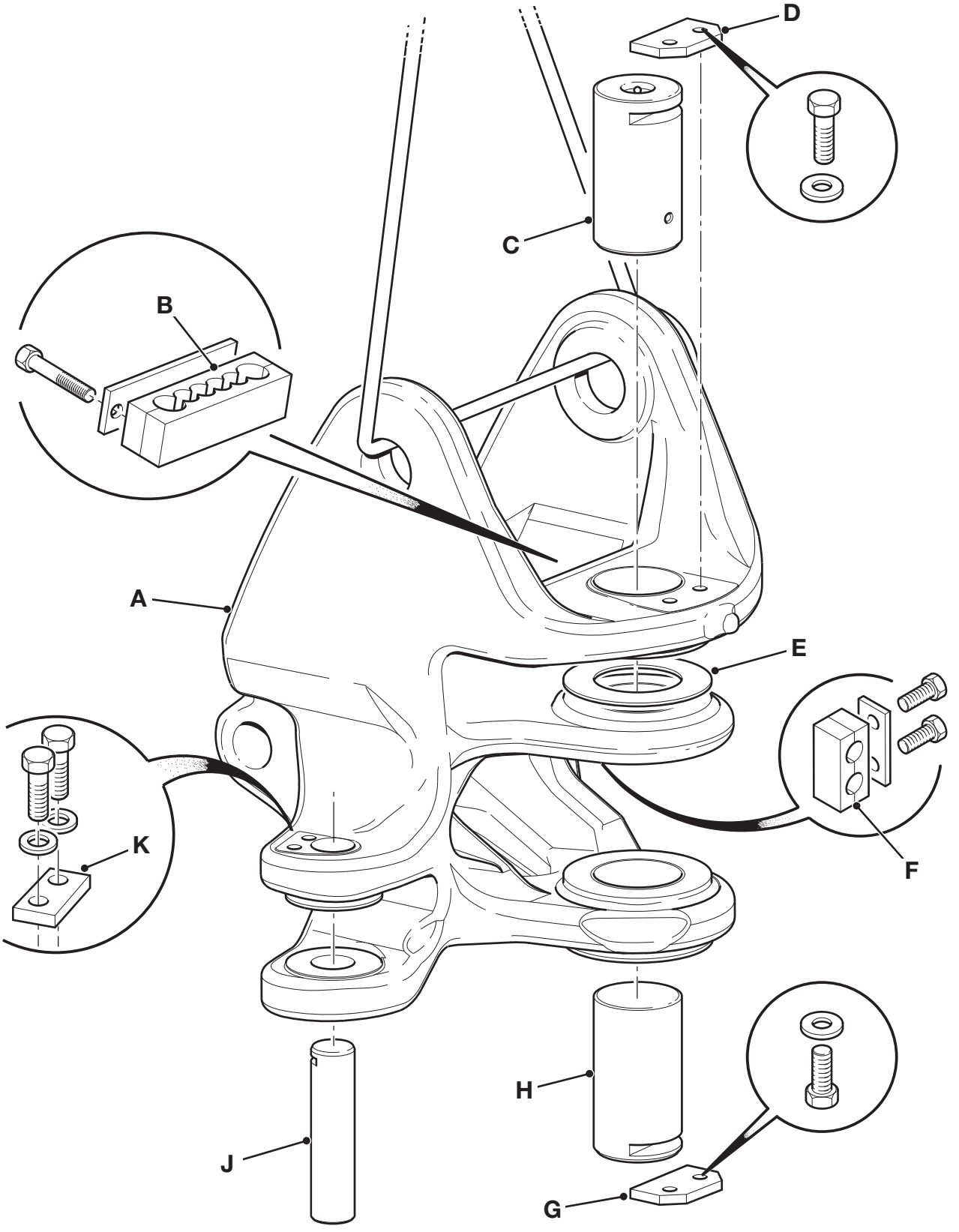


Fig 1.

Dozer

Removal and Replacement

Removal

1 Set the machine in the position shown with the dozer grounded onto suitable supports and the cab slewed to allow access. Stop the engine and relieve hydraulic pressure by operating the controls.

2 Remove the nut **B** and withdraw the bolt **A**.

3 Drive out the pivot pin **C** and lower the end of the dozer ram **H** to the ground.

⚠ WARNING

This component is heavy. It must only be removed or handled using a suitable lifting method and device.

BF-4-1_1

4 Remove the self-locking nut **F** and the bolt **E** from each pivot. Make sure that the dozer arms are supported then drive out the pivot pins **G**. Remove the dozer **D**.

5 Clean all old grease from the dozer and pivot pins.

Inspection

Inspect the pivot pins and pivot bushes for wear or damage. Renew as necessary.

Replacement

1 Apply grease to the dozer arm pivot pins.

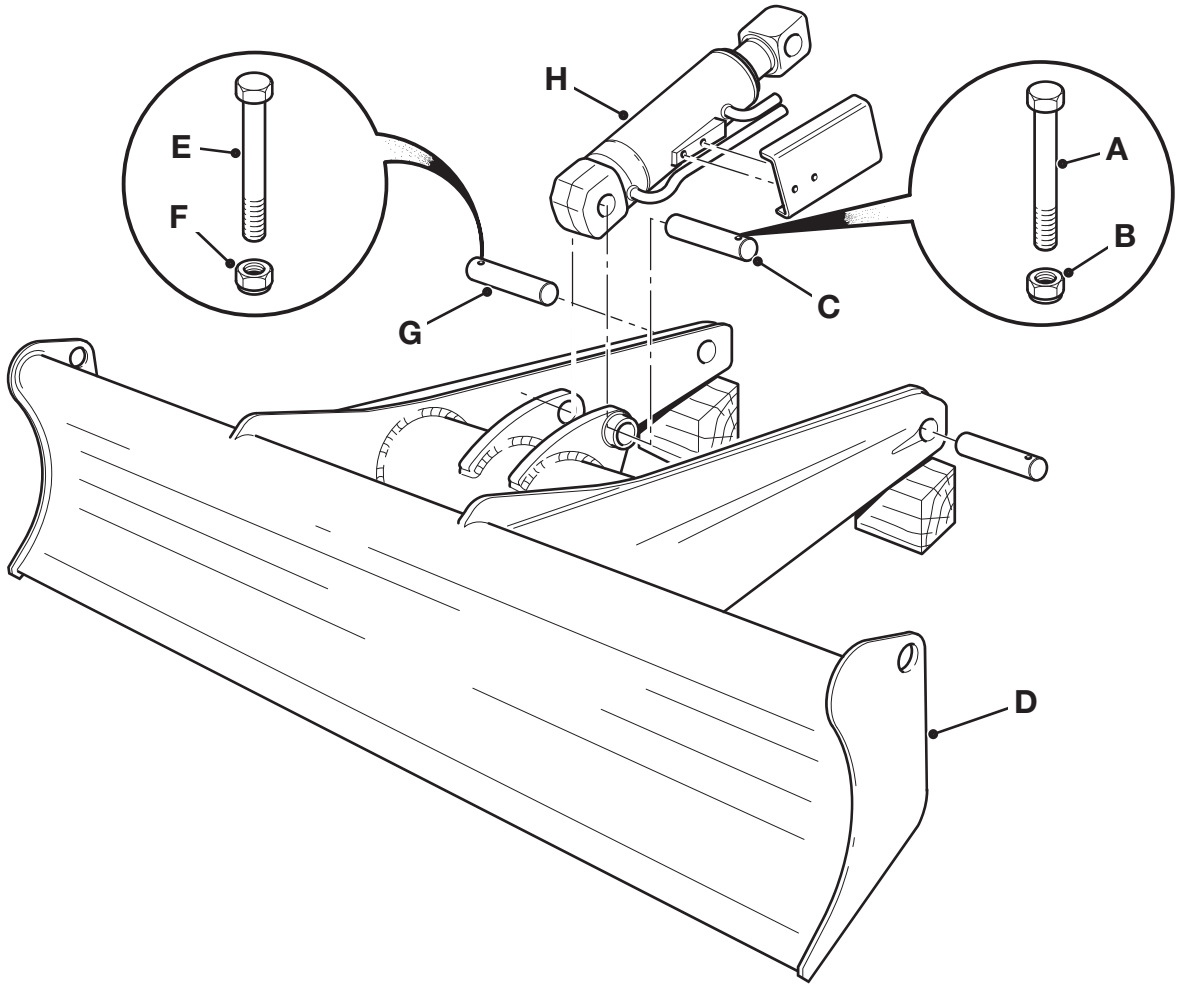
⚠ WARNING

Do not use your fingers through the holes to align the links.

8-2-9-32

2 Position the ends of the dozer into the forks of the pivots. Align the pivots and fit the pivot pins into the pivots. Retain with bolts and new self-locking nuts.

3 Position the end of the dozer ram in the fork of the dozer. Apply grease to the pivot pin, fit the pin and retain with the bolt and a new self-locking nut.



A437280-1

Fig 1.

Product: JCB 8085 Midi Excavator Service Repair Manual
Full Download: https://www.arepairmanual.com/downloads/jcb-8085-midi-excavator-service-repair-manual/

Fuel Tank

Removal and Replacement

Removal

1 Park the machine, lower the attachment to the ground and switch off the engine.

2 Disconnect and remove the battery.

3 Open the rear cover and remove the left counterweight **A**.

4 Disconnect the fuel sender **D** from the top of the fuel tank.

5 Place a suitable container beneath the fuel tank then, from beneath the machine, remove the drain plug and drain the fuel from the tank.

6 Disconnect the fuel filler pipe **E**.

7 Disconnect the fuel feed **B** and return **C** pipes.

⚠ WARNING

Fuel

Fuel is flammable; keep naked flames away from the fuel system. Stop the engine immediately if a fuel leak is suspected. Do not smoke while refuelling or working on the fuel system. Do not refuel with the engine running. Completely wipe off any spilt fuel which could cause a fire. There could be a fire and injury if you do not follow these precautions.

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Note: *It may be necessary to wait until the fuel tank retaining bolts have been removed so that the fuel tank can be moved slightly to improve access to the fuel pipe connections.*

8 Remove the two retaining bolts at the base of the tank and remove the bolt from the upper support bracket.

9 Remove the fuel tank.

Replacement

Replacement is the reverse of the removal procedure.

Note: *The fuel feed and return pipes are colour coded. The feed pipe is labelled red and is the lower of the two pipes, the return pipe is labelled green.*

Bleed the engine fuel system. Check for leaks.

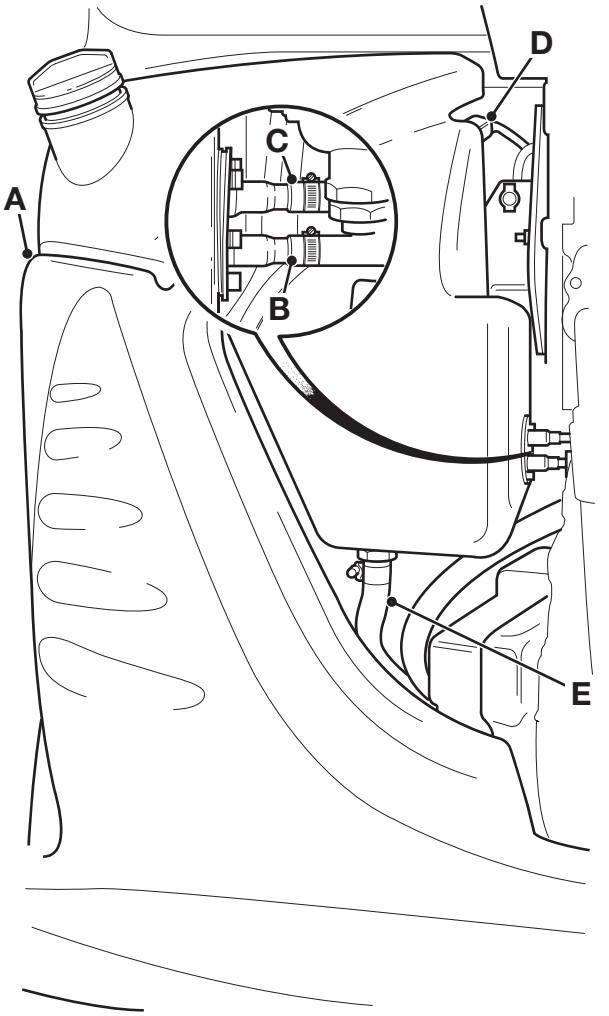

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Fig 1.

Sample manual. Download All pages at:
https://www.arepairmanual.com/downloads/jcb-8085-midi-excavator-service-repair-manual/