Section B

Body and Framework

Service Manual - 407B ZX, 408B ZX, 409B Z, 410B ZX, 411B ZX

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Cab

Glazing

Direct Glazing

TB-002_4

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 parking 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-2)*. This provides one of the easiest methods of removing the sealant around laminated glass. The tool, powered by compressed air, should be sourced locally.

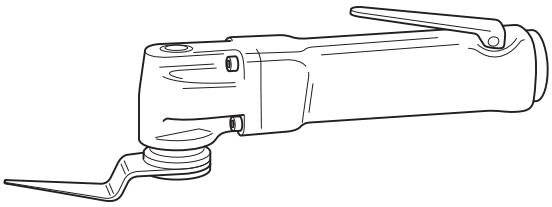

Fig 1. Pneumatic Knife

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-2)*. This method uses a 3-core wire, a wire starter tube and two handles.

i Insert the steel tube **2-A** into the old sealant on the inside of the glass.

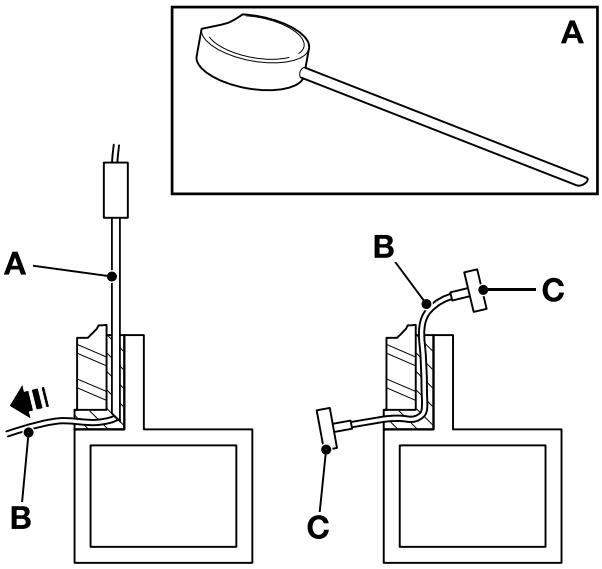

Fig 2. Braided Cutting Wire and Handles

ii Insert the braided cutting wire **2-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 **2-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-3)*. The cut-out knife can be used as a left handed or right handed tool.

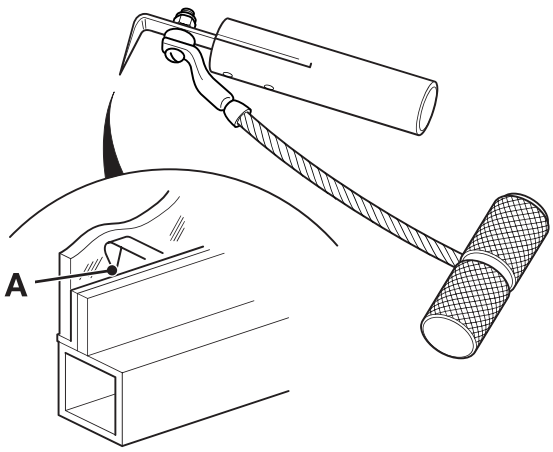

Fig 3. Cut-out Knife

i Insert the knife blade into the sealant.

ii Make sure that the blade of the knife is against the glass **3-A**.

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

d Craft Knife. ⇨ *Fig 4. (B-3)*. The blades **4-A** are replaceable.

i Insert the knife blade into the sealant.

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

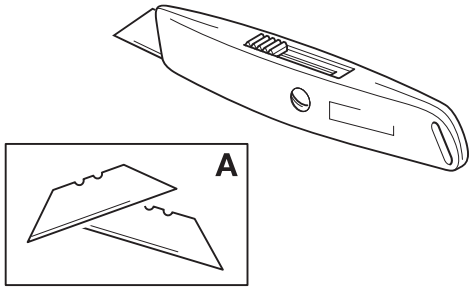

Fig 4. Craft Knife

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-3)*

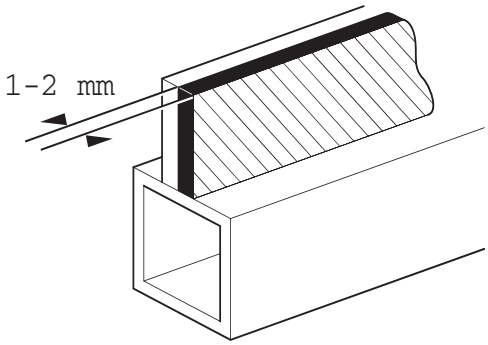

Fig 5.

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 **6-A**.

a Put two spacer blocks **6-B** onto the bottom part of the frame aperture.

b Install the new glass on the spacer blocks - Always use glass lifters **6-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.*

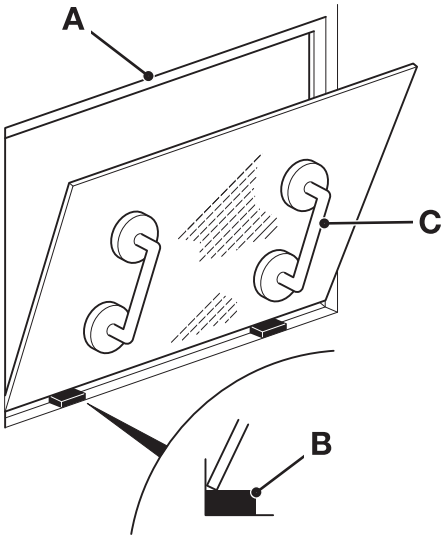

Fig 6.

2 After checking for size, remove the new glass and place it on a purpose made glass stand. ⇨ *Fig 7. (B-4)*.

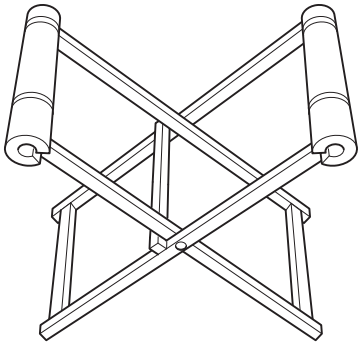

Fig 7. Glass Stand

Small panes of glass will need locating on a 600 x 700 mm x 15 to 19 mm thick plywood board **8-A**, sourced locally to fit the glass stand. 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.

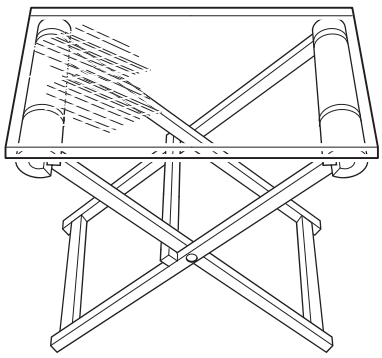

Fig 8.

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-5)*.

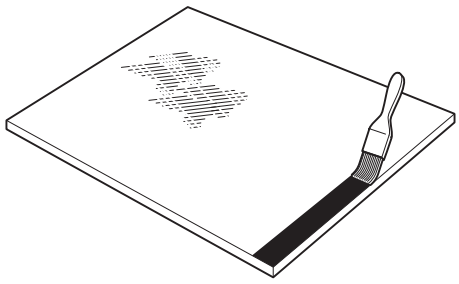

Fig 9.

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-5)*.

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.*

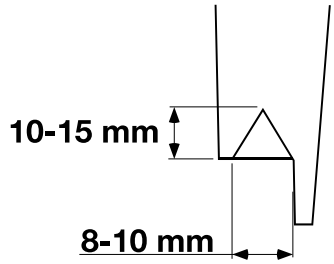

Fig 10.

6 Apply the pre-heated adhesive to the glass (do not start in a corner). Keep the nozzle guide **11-A** against the edge of the glass and make sure that the adhesive forms a continuous 'pyramid' shape. ⇨ *Fig 11. (B-5)*

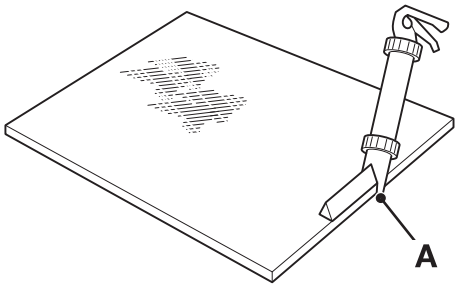

Fig 11.

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-3)* - 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-6)*

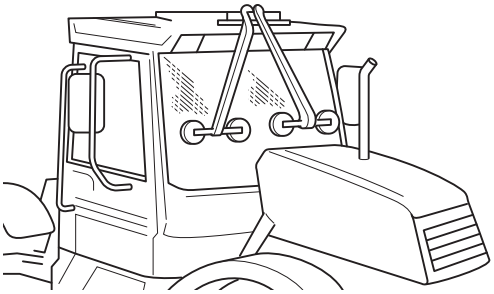

Fig 12. Typical M/c. Installation

b Sit the bottom edge of the glass on the spacer blocks. ⇨ *Fig 13. (B-6)*

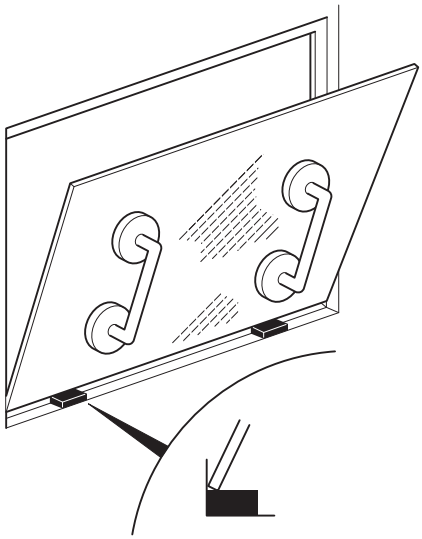

Fig 13.

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 'warning' and 'information' decals so that the new installation conforms with the original cab installation.

ROP/FOPS Structure

Checking

⚠ WARNING

You could be killed or seriously injured if you operate a machine with a damaged or missing ROPS/FOPS. If the Roll Over Protection Structure (ROPS)/Falling Objects Protection Structure (FOPS) has been in an accident, do not use the machine until the structure has been renewed. Modifications and repairs that are not approved by the manufacturer may be dangerous and will invalidate the ROPS/FOPS certification.

INT-2-1-9_6

1 Check the structure for damage.

2 Make sure that all the ROPS/FOPS mounting bolts **14-A** are in place and undamaged.

3 Make sure that the ROPS/FOPS mounting bolts **14-A** are tightened to the correct torque setting. This should be 135 Nm (100 lbf ft).

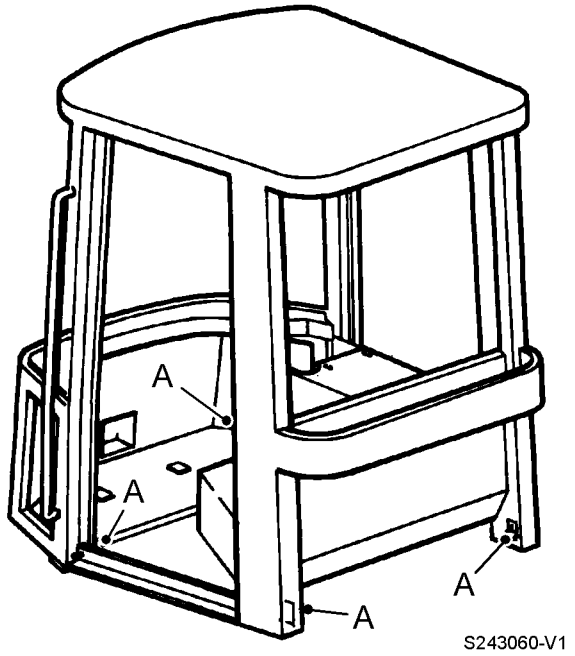

Fig 14.

Removal and Replacement

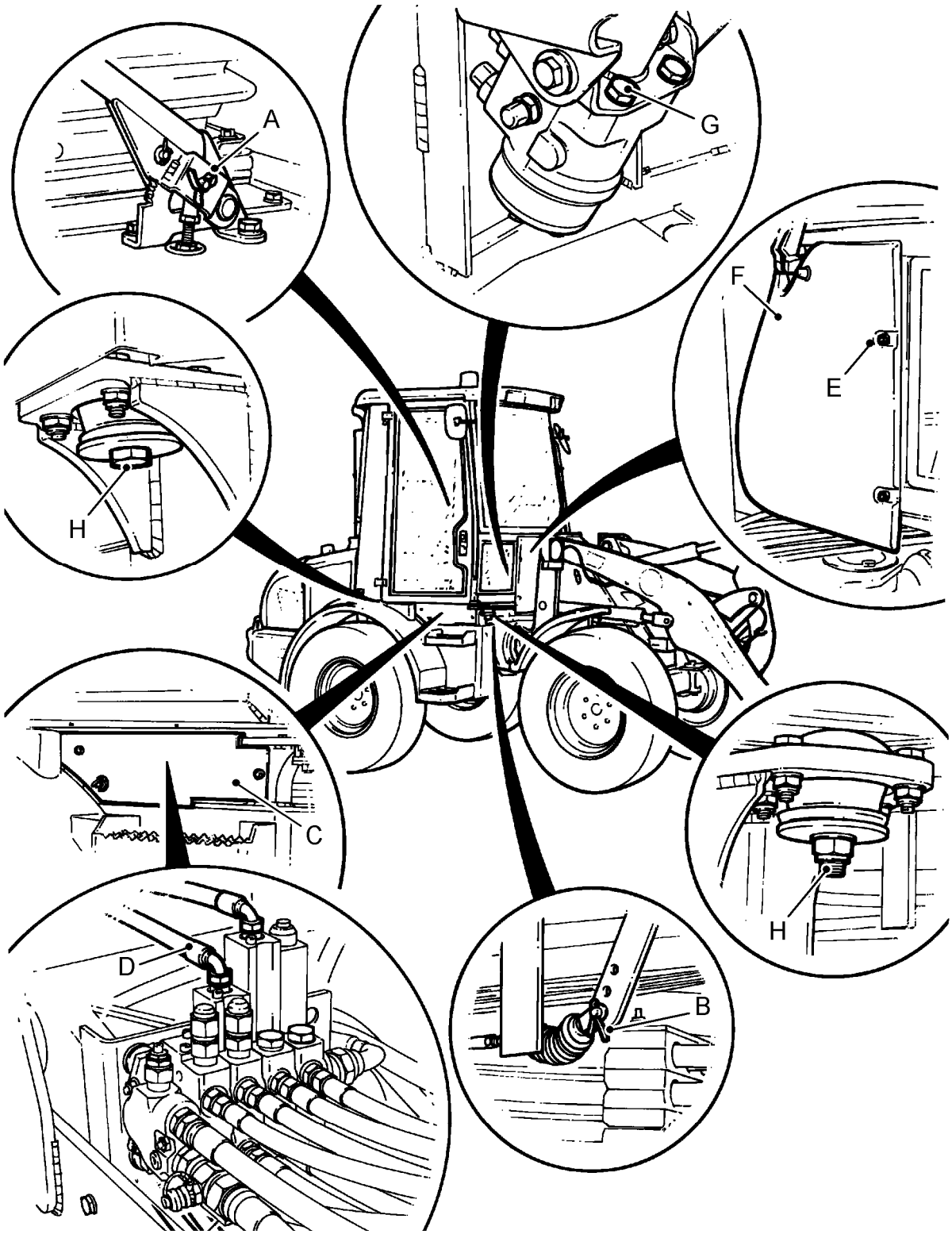
A
G
F
E
H
C
H
D
B

Fig 15.

Removal

Park the machine on firm level ground, rest the shovel on the ground, install the articulation safety link, switch off engine and operate hydraulic controls to vent system pressures.

Continue as follows:-

1 Remove the battery cover and disconnect the battery.

2 Remove split pin **15-A** at the handbrake to release the handbrake linkage.

3 Disconnect and plug the hydraulic pipework at the service brake master cylinder on the underside of the cab.

4 Remove split pin **15-B** and disconnect the throttle linkage from the throttle lever on the underside of the cab.

5 Remove cover **15-C** to gain access to the valve block and disconnect the servo pipework at points **15-D**.

6 Undo screws **15-E** and remove cover **15-F** at the front of the cab. Disconnect the windscreen washer pipework from the jets at the rear of the cover.

7 Remove the panel inside the cab covering the steering column and steering unit.

8 Unscrew bolts **15-G** securing the steering unit to the bracket on the steering column and release the steering unit.Unscrew the four cab mounting bolts **15-H** at the bottom corners of the cab. The two rear bolts are located underneath the mudguards.

9 Open and fasten back the cab doors. Attach suitable lifting equipment to the cab.

10 Carefully raise the cab fully from the chassis, ensuring that the disconnected wiring, hoses, and control cables do not foul machine parts. As the cab clears the chassis, undo the two electrical connectors on the underside of the cab to release the electrical harnesses.

Replacement

Replacement is the reverse of removal, taking care to guide hoses etc. adjacent to their reinstallation positions during relocation of the cab.

Torque tighten all bolts

After reconnecting controls and checking operation, bleed the service brake, see ***Bleeding Procedure*** Section G, before attempting to move the machine.

Table 1. Torque Settings

Item	Nm	kgf m	lbf ft
G	56	5.7	42
H	135	14	100

⚠ WARNING

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INT-2-1-9_6

Service Procedures

Rivet Nuts

TB-001_2

A 'Rivet Nut' is a one piece fastener installed 'blind' from one side of the machine body/framework. The rivet nut **16-A** is compressed so that a section of its shank forms an 'upset' against the machine body/framework, leaving a durable thread **16-B**.

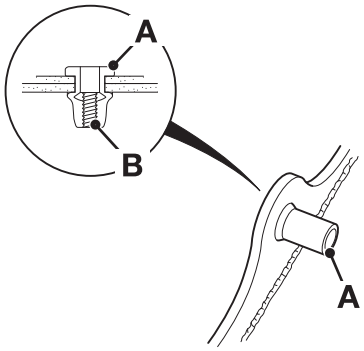

Fig 16.

Rivet nuts are fitted to various parts of the machine body and framework. They are used in a number of applications, for instance, hose clamp and hydraulic valve retention etc.

Various sized rivet nuts are available. ⇨ ***Table 2. Specifications (B-12)*** to determine the size of rivet nut to be used for particular applications.

If for any reason a new rivet nut requires fitting, then the correct installation procedure must be followed. ⇨ ***Fitting Procedure (B-13)***.

Note: *In an emergency, and if no installation tool is available, it is possible to fit a rivet nut by using a nut and bolt the same thread diameter as the rivet nut being installed. However, this is not the recommended method.*

Table 2. Specifications

Rivet Nut Thread Diameter	Rivet Nut Outside Diameter	Material Thickness	Rivet Length (Total)	Drill Hole Dia.
M5	7	0.25 - 3.00	14.00	7.10
		3.00 - 5.50	17.00	
M6	9	0.50 - 3.00	16.00	9.10
		3.00 - 5.50	19.00	
M8	11	0.50 - 3.00	18.00	11.10
		3.00 - 5.50	21.00	
M10	13	1.00 - 3.50	23.00	13.10
		3.50 - 6.00	26.00	

Note: *All dimensions in mm*

Fitting Procedure

1 Drill a hole in the machine body/framework where the rivet nut is to be fitted. De-burr hole edges.

2 Screw the rivet nut onto the mandrel of the installation tool. The bottom of the mandrel should be in line with the bottom of the rivet nut **17-A**.

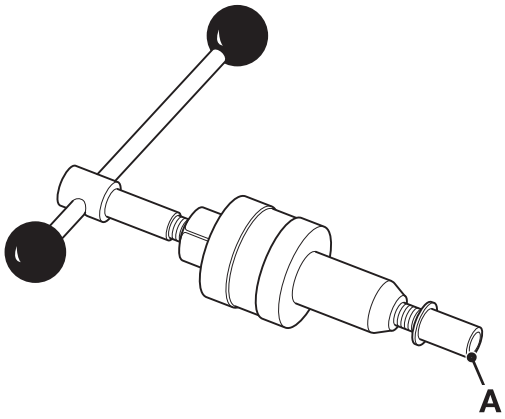

Fig 17.

3 Wind the body of the installation tool down the threaded mandrel until it touches the head of the rivet nut **18-B**.

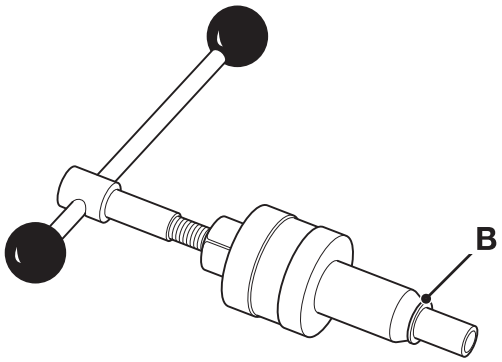

Fig 18.

4 Insert the rivet nut (assembled to the tool) into the hole drilled in step 1.

5 Hold handle **19-C** and at the same time draw the mandrel into the installation tool by turning nut **19-D**. The rivet nut will contract in length and form an 'upset' (smooth bulge) seating itself against the body/framework **19-E**.

Note: *The thread of the rivet nut must not be stripped, take care when 'upsetting' the rivet nut.*

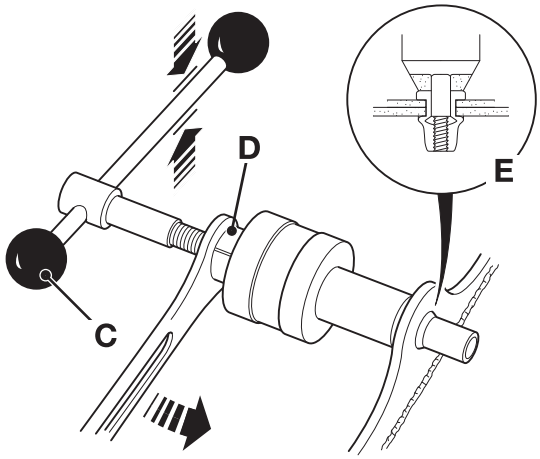

Fig 19.

6 Remove the installation tool.

Quickhitch

Dismantling and Assembly

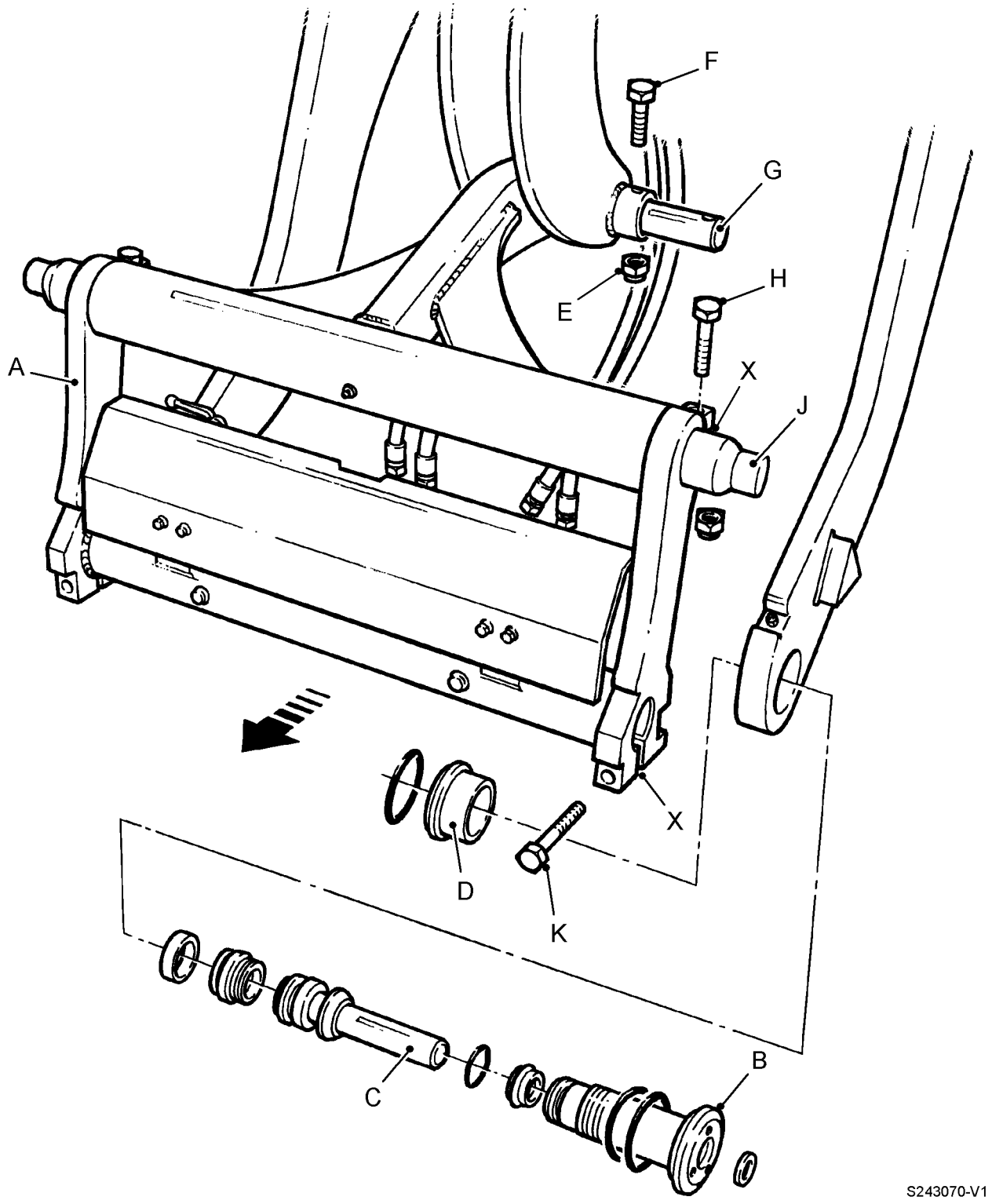
F
G
H
E
A
X
J
X
D
K
B
C
S243070-V1

Fig 20.

When Dismantling

Remove attachment from machine, lower loader arms to a suitable working height, positioning Quick Hitch link **20-A** vertically, and arrange for loader arms to be propped securely.

Inspect piston rod ends for damage over the outer 50 mm (2 in), and dress lightly any nicks or burrs before proceeding.

Operate Quick Hitch lever several times to vent system of residual pressure.

Slacken pinch bolt **20-K** and, using tool 992/07000, unscrew end cap **20-B**. Withdraw piston rod **20-C**. Repeat for opposite side.

⚠ WARNING

If it is necessary to force out the piston rod, use only gentle hydraulic pressure, ensuring that adequate safety precautions are taken. Severe injury can be caused by a rod being released suddenly.

BF-3-4

If the complete unit is to be removed, disconnect and plug the feed and return pipes. As now the Quick Hitch link is suspended from the tipping lever pivot pin, if the shovel ram is operated slowly, the link will move free of loader arm pivot bushes **20-D**.

⚠ CAUTION

Suitable measures must be taken to support the Quickhitch cylinder and link assembly before continuing.

BF-3-6

Undo nut **20-E** and bolt **20-F** and drive out tipping lever pivot pin **20-G**. Remove pinch bolts **20H** from the bosses of the Quick Hitch side plates, then drive out pin **20-J** after firstly ensuring that any surface imperfections on the pin are cleaned up.

The Quick Hitch subframe now may lifted away from the machine.

Inspect, and renew if necessary, bushes **20-D** in loader arms.

When Assembling

Reassembly procedure is the reverse of dismantling.

Clean threads of end caps and cylinder thoroughly with a wire brush, and ensure that they are free from grease, hydraulic oil, and old Loctite using JCB Cleaner & Degreaser. Allow solvent to dry for at least 15 minutes before applying Loctite.

Check that piston and rod surfaces are free from any imperfections. Clean all components thoroughly in JCB Special Hydraulic Fluid and, using it as a lubricant, renew all seals, wear rings and 'O' rings.

Apply Loctite Superflex RTV3 or Dow Corning 781 to slots **20-X** in both Quick Hitch links **20-A** before fitting pinch bolts **20-K** and **20-H**.

Apply Loctite 577 to threads of end cap **20-B**, screw into bore until resistance is felt then back off 1/4 turn before tightening pinch bolt **20-K**.

When reassembling the tipping lever pivot pin to the Quick Hitch it is important to ensure that the pin is centralised in the tipping lever before tightening pinch bolts **20-H**.

Table 3. Torque Settings

Item	Nm	kgf m	lbf ft
H	244	25	180
K	244	25	180

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Loader Arms

Removal and Replacement

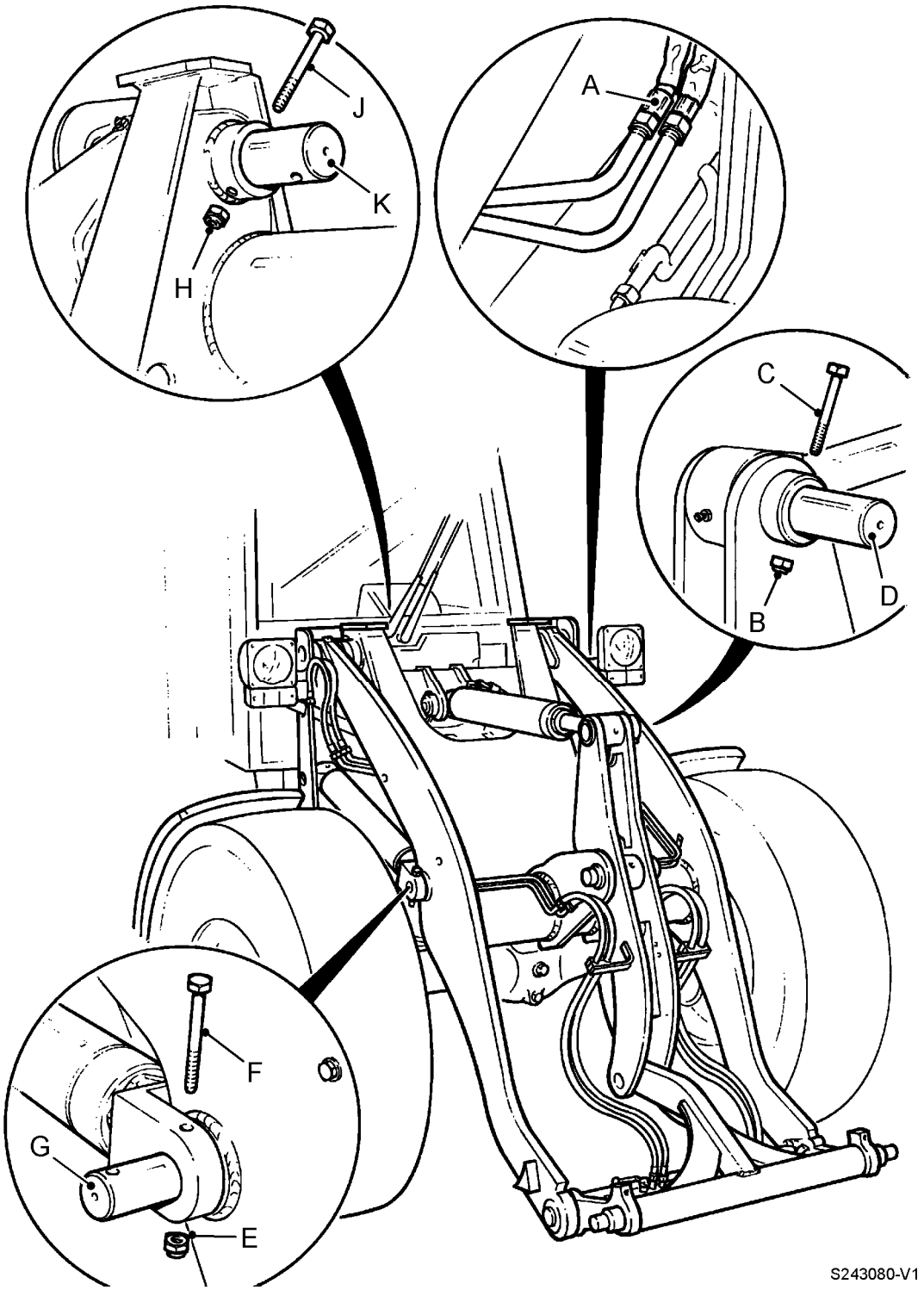


Fig 21.

⚠ CAUTION

Do not commence work on loader arms or ancillaries unless loader arms are in the fully lowered position with the shovel resting on the ground in the loading attitude, and having vented the hydraulic system of residual pressure by operating the controls after switching off the engine.

BF-3-5

Removal

1 Disconnect and plug hydraulic pipework **21-A** at each side of the machine.

2 If required, remove the Qickhitch ⇨ *Quickhitch (B-14)*.

3 Using suitable lifting equipment, support the loader arms.

4 Remove nut **21-B**, bolt **21-C** and drive out tipping lever pivot pin **21-D**.

5 Remove nut **21-E**, bolt **21-F** and drive out lift ram pivot pin **21-G**. Repeat for the other side.

6 Remove nut **21-H**, bolt **21-J** and drive out pivot pin **21-K**. Repeat for the other side.

7 Remove the loader arm assembly.

Replacement

Replacement is the reverse of the removal procedure.

Torque tighten all bolts.

Table 4. Torque Settings

Item	Nm	kgf m	lbf ft
B	56	5.7	42
E	56	5.7	42
H	56	5.7	42

Pivot Seal Fitting

The following technique must be used to assemble the grease/dirt seals fitted to the loader pivots. Failure to do this will result in damage to the seal lips.

Fit the seal with the lip facing outwards.

The seal is a force fit into its housing. Take great care not to damage the seal during fitting.

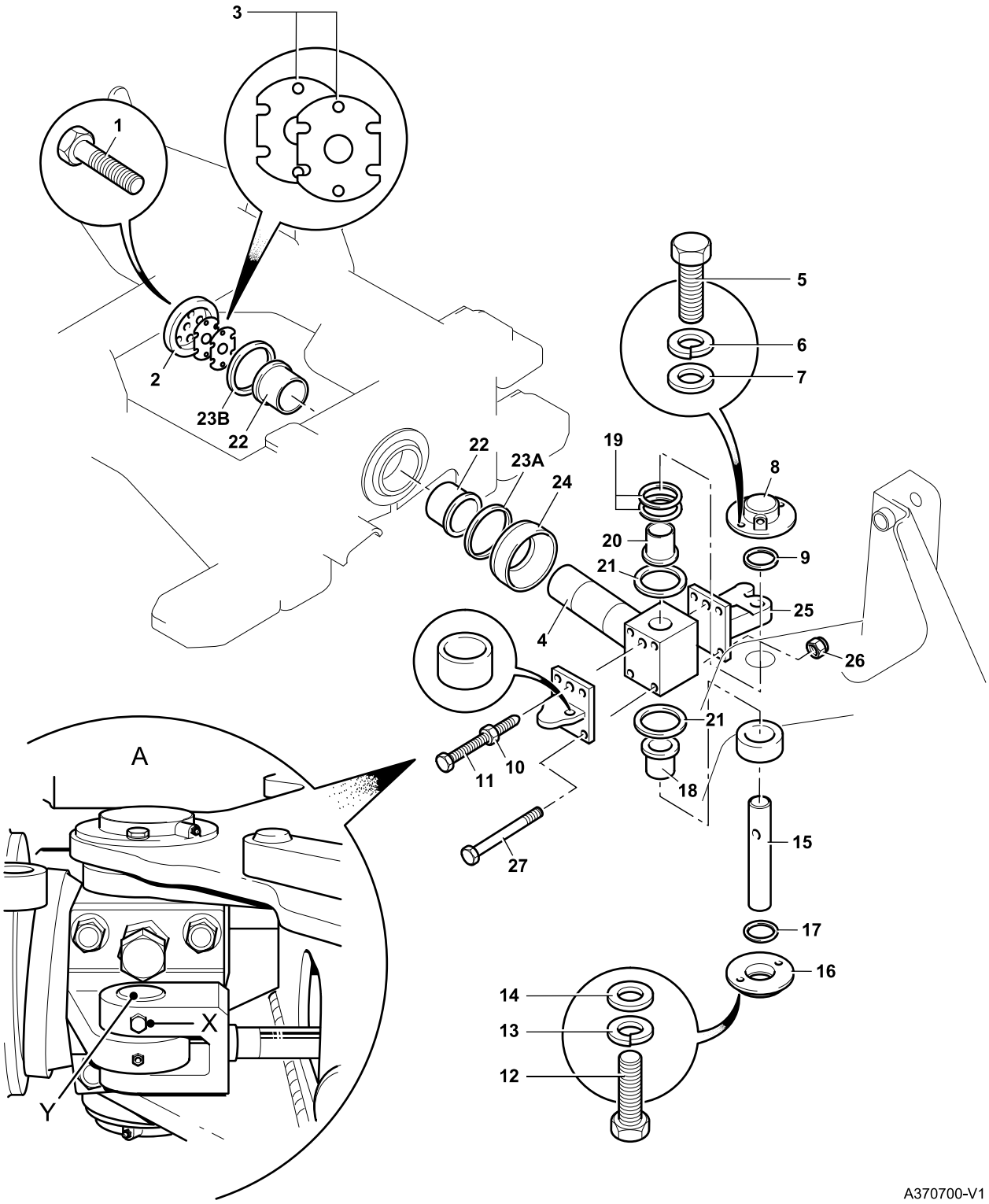
The seal must be flush with its housing and must be straight, a suitable fitting dolly should be used.

The pivot pin should be inspected before fitting. A damaged pin will damage the seal.

Grease the pivots before using the machine.

Articulated Joint

Removal and Replacement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23B
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23A
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26
21
10
11
18
15
27
17
16
14
13
12
A
X
Y
A370700-V1

Fig 22.

If wear is evident in the articulated joint the bushes and seals must be renewed. Worn bushes will cause a knocking noise from the area of the articulated joint, particularly when starting/stopping or changing steer direction of the machine.

Note: *Worn steer ram pivots may also cause knocking. Before removing the articulated joint check the condition of the steer ram pivot pins and bushes.*

To facilitate removal of the joint, the two halves of the machine must be separated. **This procedure must be carried out in a workshop equipped with a suitable overhead crane**.

Prepare the Machine

1 Remove any attachments, lower the loader arms to the ground. Stop the engine and operate the loader controls to release any trapped hydraulic pressure.

2 Securely chock the front and rear wheels and then disconnect the propshaft from the front axle see ***Front Axle*** Section F.

3 Undo the 6 Verbus Ripp bolts **22-1** and remove the retaining plate **22-2**. Retrieve any shims **22-3**.

Separating the Machine Halves

1 Remove the lock bolt(s) **22-X** and drive out the steer ram pivot pin(s) **22-Y** as shown at **22-A**.

Note: *410, 411 machines have 2 steer rams.*

2 Tag and disconnect the loader hydraulic hoses at the loader valve. Undo the hose clamp.

3 Disconnect the loader electrical harness multi-plug from the main harness.

4 Arrange slings under the loader arms near the rear pivots, ⇨ *Fig 23. (B-25)*. Using an overhead crane lift the front of the machine until it is 150 mm (6 in) clear of the ground. Lower the machine onto suitable block supports under the rear chassis.

5 Remove the chocks from the front wheels and operate the overhead crane to draw the loader end of the machine forward and at the same time down approximately 75 mm (3 in) until the oscillation pivot is disengaged from the rear chassis.

6 Lower the loader (front) end of the machine on to suitable blocks placed under the chassis. Chock the front wheels.

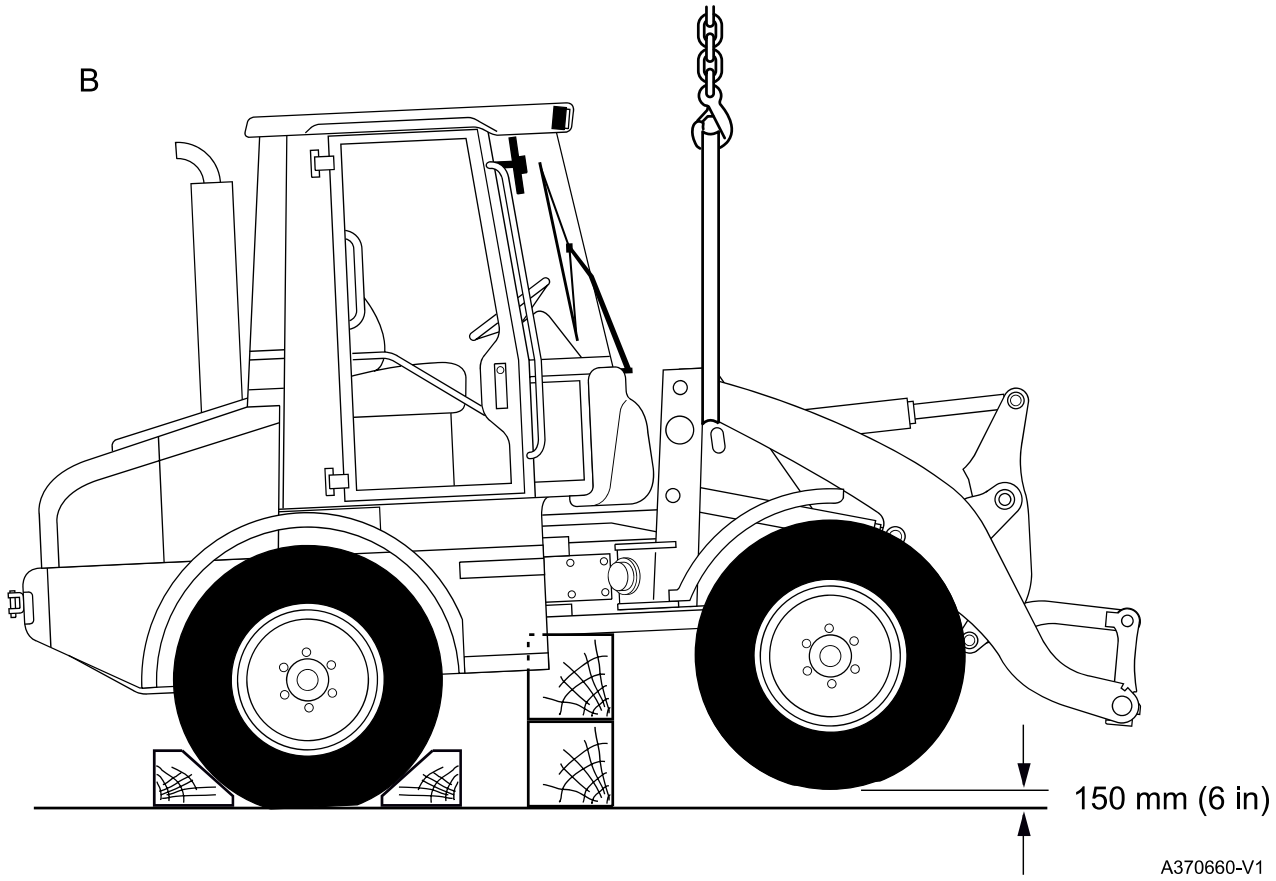


Fig 23.

Inspecting the Articulated Joint

1 Push and pull the articulated joint up and down to check for any play in the vertical pivot bushes **24-18** and **24-20**. If any play is detected the bushes must be renewed.

2 Attach the overhead crane to the articulated joint **24-4** using a suitable sling. Remove the bolts **24-5**, washers **24-6**, **24-7** and remove the top pivot cover **24-8**. Retrieve the `O' ring grease seal **24-9**.

3 Loosen the lock nut **24-10**. Remove the lock bolt **24-11**.

4 Carefully remove the bolts **24-12**. If the pivot pin **24-15** is a loose fit it may drop out as the cover **24-16**, O' ring grease seal **24-17** is removed. Be ready to support the pivot pin. If necessary use a suitable drift to drive out the pin from above.

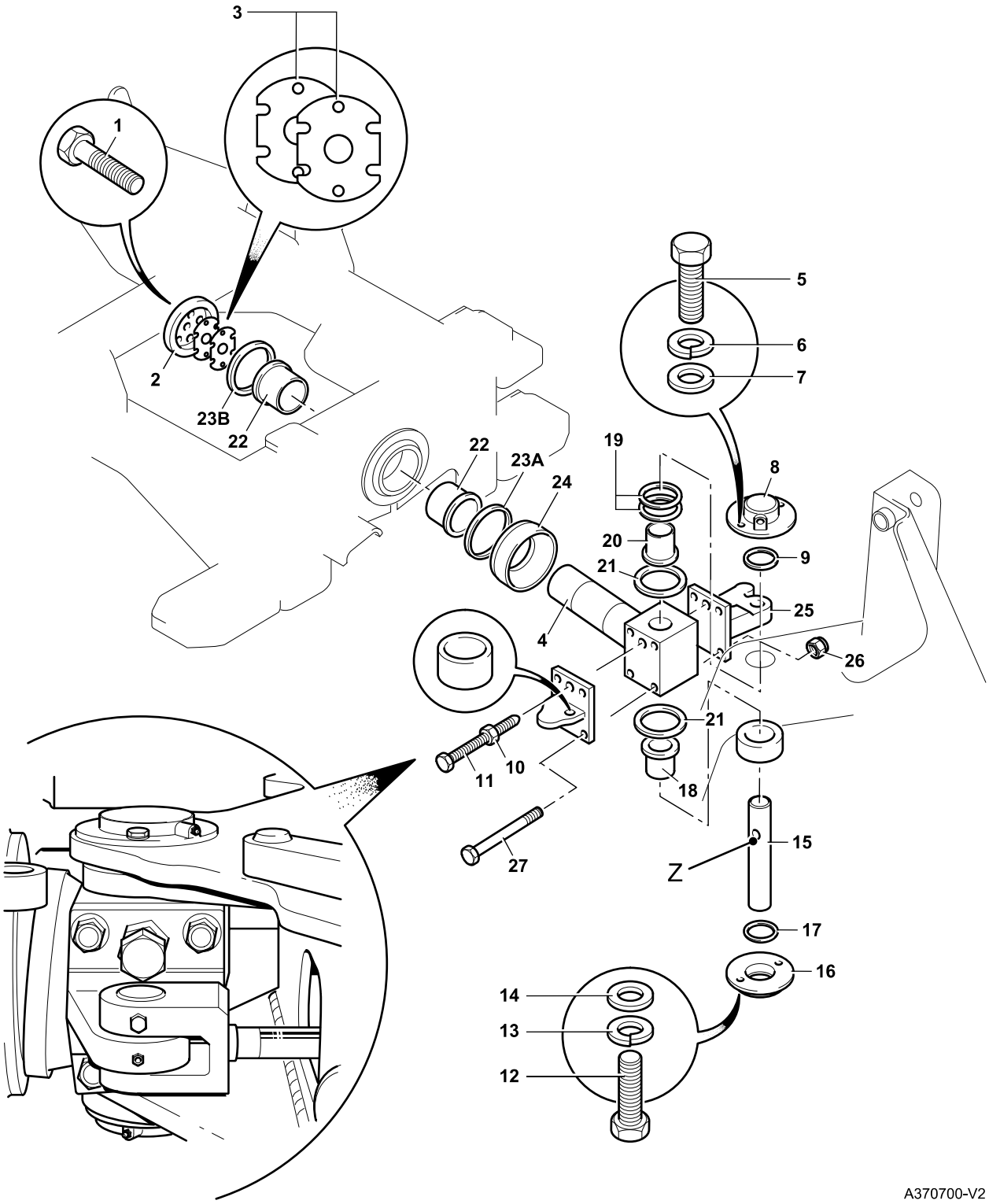
5 Using the overhead crane remove the articulated joint **4** from the chassis.

6 Check for wear in the oscillation bushes **24-22** as follows:

a Use the overhead crane to re-assemble the articulated joint **24-4** to the front chassis. Temporarily re-fit the shims **24-3** and retaining plate **24-2** using two original Verbus Ripp bolts **24-1**.

b Push and pull the articulated joint up and down and from side to side to check for any play in the bushes. If any play is detected the bushes must be renewed.

c Remove the articulated joint from the rear chassis. Discard all 6 Verbus Ripp bolts.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A370700-V2

Fig 24.

Renewing the Bushes

Before renewing the bushes, carefully inspect pivot pin **24-15**, articulated joint **24-4** and ring spacer **24-24** bearing faces for signs of wear or damage. Clean off all dirt, rust and grease from the relative areas of joint components and chassis. If maintenance has been neglected or the grease seals have been damaged, water ingress may have caused rust damage. If there are signs of wear or damage, components should be renewed as applicable. If necessary the ring spacer **24-24** can be removed from the articulated joint using a soft faced hammer. **Bushes must be renewed as pairs**.

1 The oscillation and vertical pivot bushes can be driven out of the chassis using suitable drifts.

2 When removing the top vertical pivot bush **24-20** retrieve any shim(s) **24-19** located between the shoulder and the chassis.

3 Fitting new vertical pivot bushes:

a Using a suitable portable hydraulic press, pull in the bottom bush **25-18**. As the bush is drawn in, blow any shards of bronze clear of the bush shoulder, making sure the bush seats correctly in the chassis.

b Using a suitable micrometer, measure the distances shown at **25-D1** and **25-D2**.

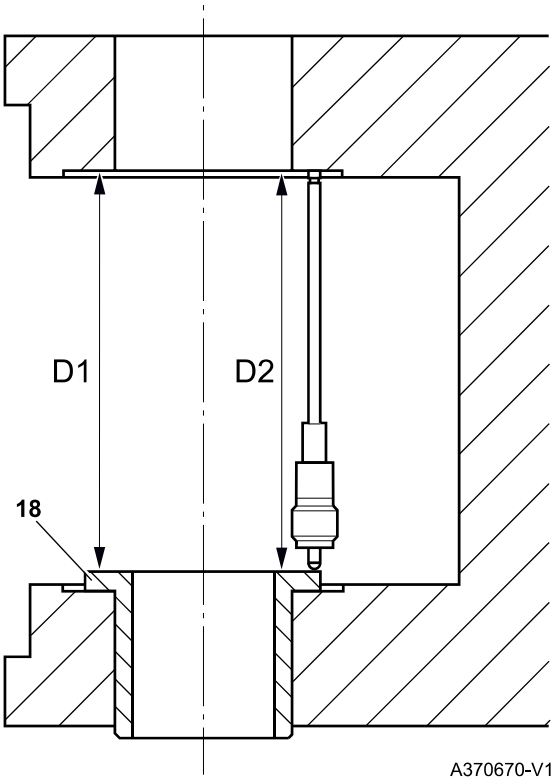

Fig 25.

Calculate the shim thickness as follows:

Nominal dimension = 202 mm (7.953 in)

Clearance required for articulated joint =

min 0.1 mm (0.004 in)

max 0.3 mm (0.012 in)

Shim thicknesses available - 0.25 (0.01 in) and 0.5 mm (0.02 in)

Example

D1 = 202.65 mm

D2 = 202.75 mm

Use smallest dimension i.e. D1

202.65 - 0.5 = 202.15 (inside tolerance)

202.65 - 0.25 = 202.4 (outside tolerance)

Use one 0.5 mm shim

c Place the required shim(s) **26-19** over the bush **26-20** and draw the bush up into the chassis using the press, blowing bronze shards clear as with the bottom bush.

d Fit new seals **26-21** around the shoulders of the bushes.

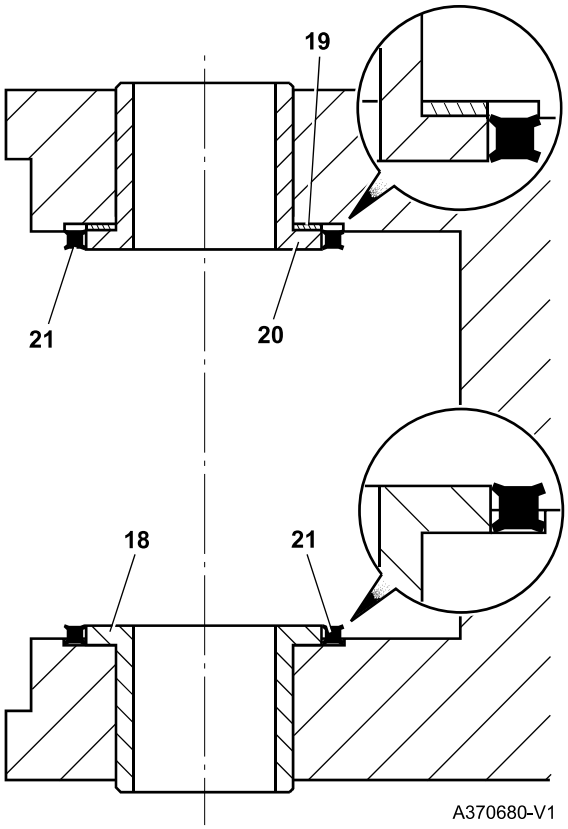

Fig 26.

4 Fitting new oscillation bushes:

a Coat the outer diameter of new bushes **24-22** with JCB Threadlocker and Sealer.

b Using a suitable portable hydraulic press pull in the front and rear bushes into the front chassis simultaneously.

5 Fit a new grease seal **24-23A**.

6 Use the overhead crane to fit the articulated joint **24-4** to the front chassis. Orientate pivot pin **24-15** as shown. Fit the pin in the joint, aligning the lock bolt location hole **24-Z** with the threaded hole for lock bolt **24-11**. Fit and tighten the lock bolt and then the lock nut **24-10**.

7 Locate new `O' rings **24-9** and **24-17** and fit the top (**24-8**) and bottom (**24-16**) covers, orientating the grease points so that they are both accessible from one side of the machine.

8 If ring spacer **24-24** has been removed or is to be renewed, locate it over the articulated joint and drive it home with a soft faced hammer.

Important: *Make sure that the new grease seal **24-23A** is in position between the articulated joint and the chassis.*

9 Use the overhead crane to manoeuvre the loader (front) section of the machine onto the articulated joint. If difficulty is experienced, a 3/4 UNC bolt and suitable plate can be used in the end of the joint to draw the sections together.

10 When you are sure that the sections are fully together check the shim requirements between the rear chassis and articulated joint.

- **a** Temporarily fit shims **27-3** of a known thickness together with retaining plate **27-2** as shown at **27-C**.
- **b** Measure the gap **27-C** between the shoulder of the bush and the retaining plate using suitable feeler gauges. If there is no gap, increase the shim stack until there is. Measure the gap.
- **c** Calculate the total shim thickness required to give a gap of 0.1 mm (0.004 in) (min) to 0.3 mm (0.012 in) (max). Select the required shims. Shims are available in 0.25 mm (0.01 in) and 0.5 mm (0.02 in) thickness.

11 Fit a new grease seal **27-23B**.

12 Fit the required shims together with retaining plate **27-3**. Use new Verbus Ripp bolts **27-1** and progressively torque tighten to 120 Nm (88 lbf ft).

13 If the articulated joint **24-4** has been renewed or the steer ram pivot castings **24-25** have been removed, replace the castings. Torque tighten the nuts **24-26**/ bolts **24-27** to 640 Nm (472 lbf ft).

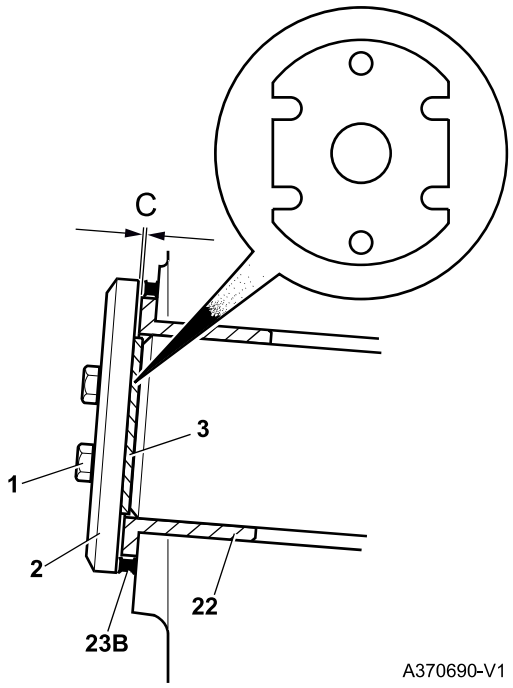

Fig 27.