



Section G

Brakes

Service Manual - 506C, 506CHL, 508C Loadalls

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Section G - Brakes

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Technical Data

All Models

Service Brakes

Type	JCB Oil-Immersed Discs
Actuation	Tandem Circuit Hydraulic, Direct Actuation
Location	Front Axle (2 Brake Packs) Rear Axle (2 Brake Packs)

Note: As the service brakes are located in the axle, instructions for dismantling and assembly are shown under **Transmission**, Section F.

Master Cylinder

Piston Diameter	35 mm (1.125 in)
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Park Brake

Type	Manually Adjusted Caliper
Disc Diameter	279.4 mm (11 in)

Basic Operation

General Description

The service (foot) brakes act on the front axle halfshafts. On 506CHL and 508C machines, additional service brakes are fitted in the rear axle hubs. They are oil-immersed, multi-disc brakes which are operated hydraulically by means of a single pedal and a servo assisted master cylinder. The brake cylinder reservoir is situated in front of the instrument panel in the cab.

On machines with the optional electric 2/4-wheel drive selection, pressing the brake pedal will automatically select 4-wheel drive (if it has not already been selected manually). This gives increased braking effect. The transmission will switch back to 2-wheel drive when the brake pedal is released.

The cable operated park brake acts on a disc which is mounted on the gearbox output shaft to the front axle.

Service Procedures

Brake Piston Seal Leakage

Introduction

The most common reason for internal piston seal leakage is a build-up of axle contamination from excessive brake wear caused by extended service periods. This allows metal particles to build-up on the sealing surfaces causing scoring and allowing low pressure leaks.

There are two types of internal leakage that can occur within the axle and hub:

- 1 Low Pressure Leaks - Seal damage, or scoring to seal component surfaces.
- 2 High Pressure Leaks - Mechanical leakage through a porous casing, or blanking screw threads.

Note: The low pressure leak test should be performed first. Low pressure leaks are difficult to find using a high pressure test - seals and other components can distort and form a seal under pressure.

The following areas identify where leakage can commonly occur:

Low Pressure:

- 1 Swivel to annulus carrier sealing O-rings and sealing surfaces.
- 2 Brake piston seals.
- 3 Annulus carrier to swivel sealing o-ring surfaces.
- 4 Piston and annulus carrier sealing surfaces (porosity, scores, nicks & scratches etc.).

High Pressure:

- 5 Blanking screws (x2) - missing, loose or no thread sealant used.
- 6 Porosity through casing from internal galleries.
- 7 Blanking screws (x2) - missing, loose or no thread sealant used.
- 8 Annulus carrier to piston seals sealing surfaces.

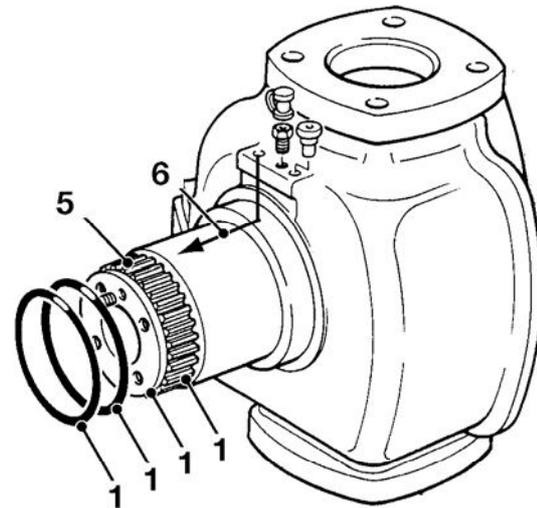


Fig 1.

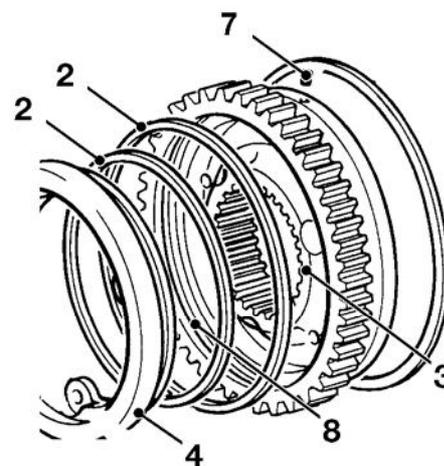


Fig 2.

Testing

The following procedure explains how to check if a brake seal or component is severely damaged/perished, or if the seal has a small cut or nick. The test must only be done when the axle is cold.

WARNING

Before working on the brake system make sure the machine is on level ground and chock all four wheels.

BRAK-1-4

WARNING

Do not drive the machine with any part of its brake system disconnected. When the following test has been completed reconnect all brake pipes and bleed the brake system using the recommended procedure.

BRAK-2-1

Test for a High Pressure Leak

- 1 Remove and cap brake piston feed pipe **3A**.
- 2 Fill the brake piston housing with JCB Special Gear Oil.
- 3 Check for severe piston seal damage:
 - a Install a hand pump fitted with a 0 - 40 bar (0 - 600 lbf/in²) pressure gauge to port **3B**.

Note: The hand pump must be filled with JCB Light Hydraulic Fluid. Do not exceed 69 bar (1000 lbf/in²).

- b Use the hand pump to generate a pressure in the brake piston housing.
- c If the pressure falls off rapidly, or if no pressure reading can be obtained, a seal is severely damaged and needs replacing, or a leak path exists.
- d Remove planet hub and identify the source of the leakage before proceeding any further.

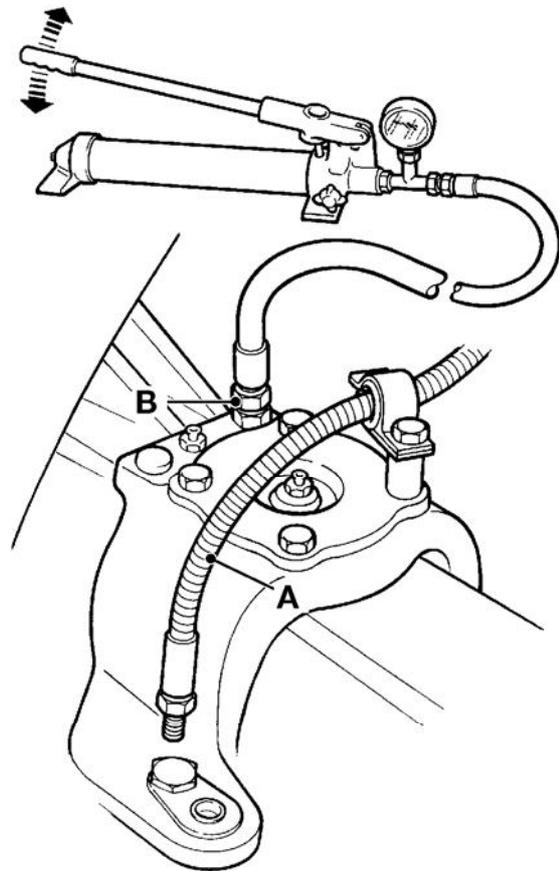


Fig 3. Test for a High Pressure Leak

Test for a Low Pressure Leak

- 1 Check for small cuts or nicks in the piston seal:
 - a Install an adapter fitted with a piece of clear tube to the brake piston port **4B**.

Note: The tube must be kept vertical during the test, use tape to attach the tube to the side of the machine.

- b Fill the tube until approximately three quarters full with JCB Special Gear Oil.
- c Using a suitable pen, mark the level line of the brake fluid on the tube **4C**.
- d After approximately 1/2 hour, check if the level has dropped below the original marked line, if it

has then check the brake components for slight nicks, cuts, leak paths or generally for wear.

- 2 Repeat steps a to d for the opposite brake piston seal.
- 3 Reconnect all brake pipes and bleed the brake system.

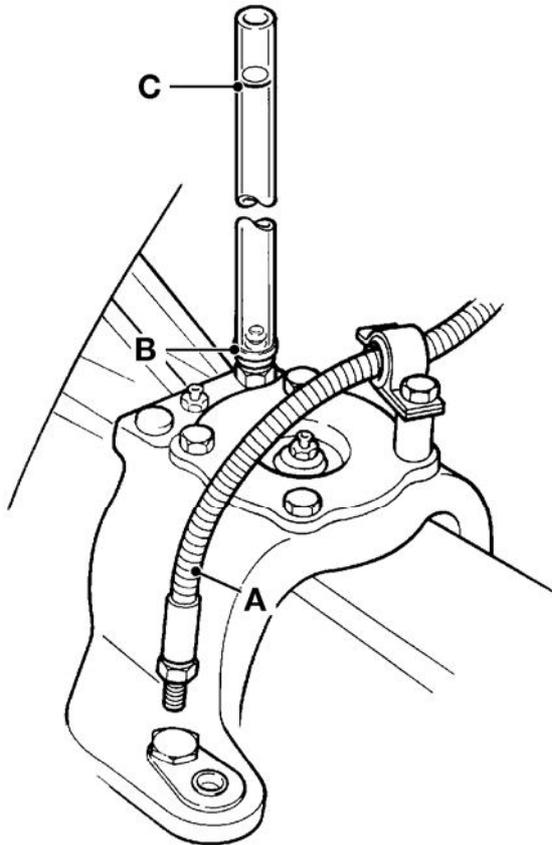


Fig 4. Test For A Low Pressure Leak

Bleeding Procedure

Front Axle

WARNING

Before proceeding with the bleeding procedure it is important to ensure that the park brake is engaged and that one pair of wheels is blocked on both sides.

BRAK-1-2

Fill the reservoir with correct fluid (see *Lubricants and Capacities*, Section 3) and ensure that throughout the bleeding procedure the level is not allowed to fall below the MINIMUM mark.

WARNING

Use of incorrect fluid will cause serious damage to the seals which could in turn cause brake failure.

BRAK-1-1

Bleed the two brakes lines, each in turn, as follows:

- 1 Attach a tube to bleed screw **5A**, ensuring that the free end of the tube is immersed in fluid contained in a suitable container.
- 2 Open the bleed screw and apply one rapid full stroke of the brake pedal followed by three rapid short strokes from the halfway pedal position. After the third short stroke, allow the pedal to return quickly to its stop.
- 3 Continue bleeding normally until all air is dispelled, closing the bleed screw with the pedal fully depressed.

Repeat the procedure for the second brake.

Top up reservoir to the full mark.

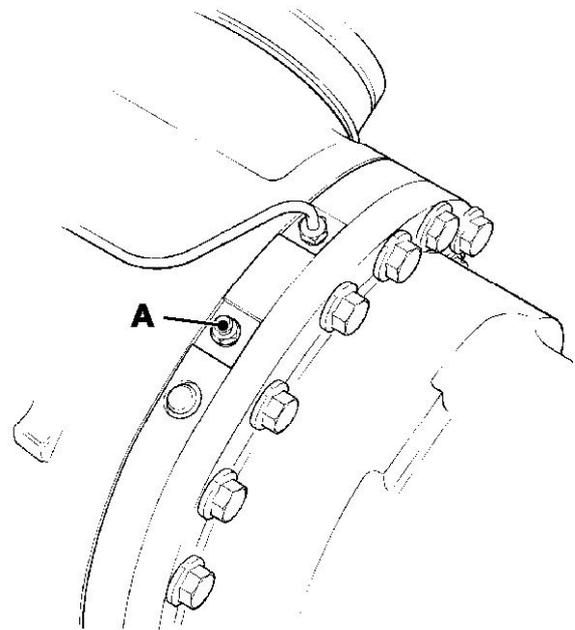


Fig 5. Front Axle

Rear Axle

WARNING

Before proceeding with the bleeding procedure it is important to ensure that the park brake is engaged and that one pair of wheels is blocked on both sides.

BRAK-1-2

Fill the reservoir with correct fluid (see *Lubricants and Capacities*, Section 3) and ensure that throughout the bleeding procedure the level is not allowed to fall below the MINIMUM mark.

WARNING

Use of incorrect fluid will cause serious damage to the seals which could in turn cause brake failure.

BRAK-1-1

Bleed the two brake lines, each in turn, as follows:

- 1 Attach a tube to L.H. bleed screw **6B**, ensuring that the free end of the tube is immersed in fluid contained in a suitable container.
- 2 Open the bleed screw and apply one rapid full stroke of the brake pedal followed by three rapid short strokes from the halfway pedal position. After the third short stroke, allow the pedal to return quickly to its stop.
- 3 Continue bleeding normally until all air is dispelled, closing the bleed screw with the pedal fully depressed.

Repeat the procedure for the R.H. bleed screw.

Top up reservoir to the full mark.

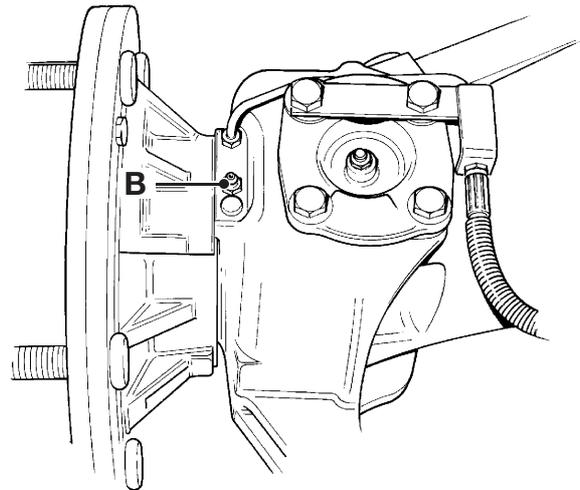


Fig 6. Rear Axle

Master Cylinder

Removal and Replacement

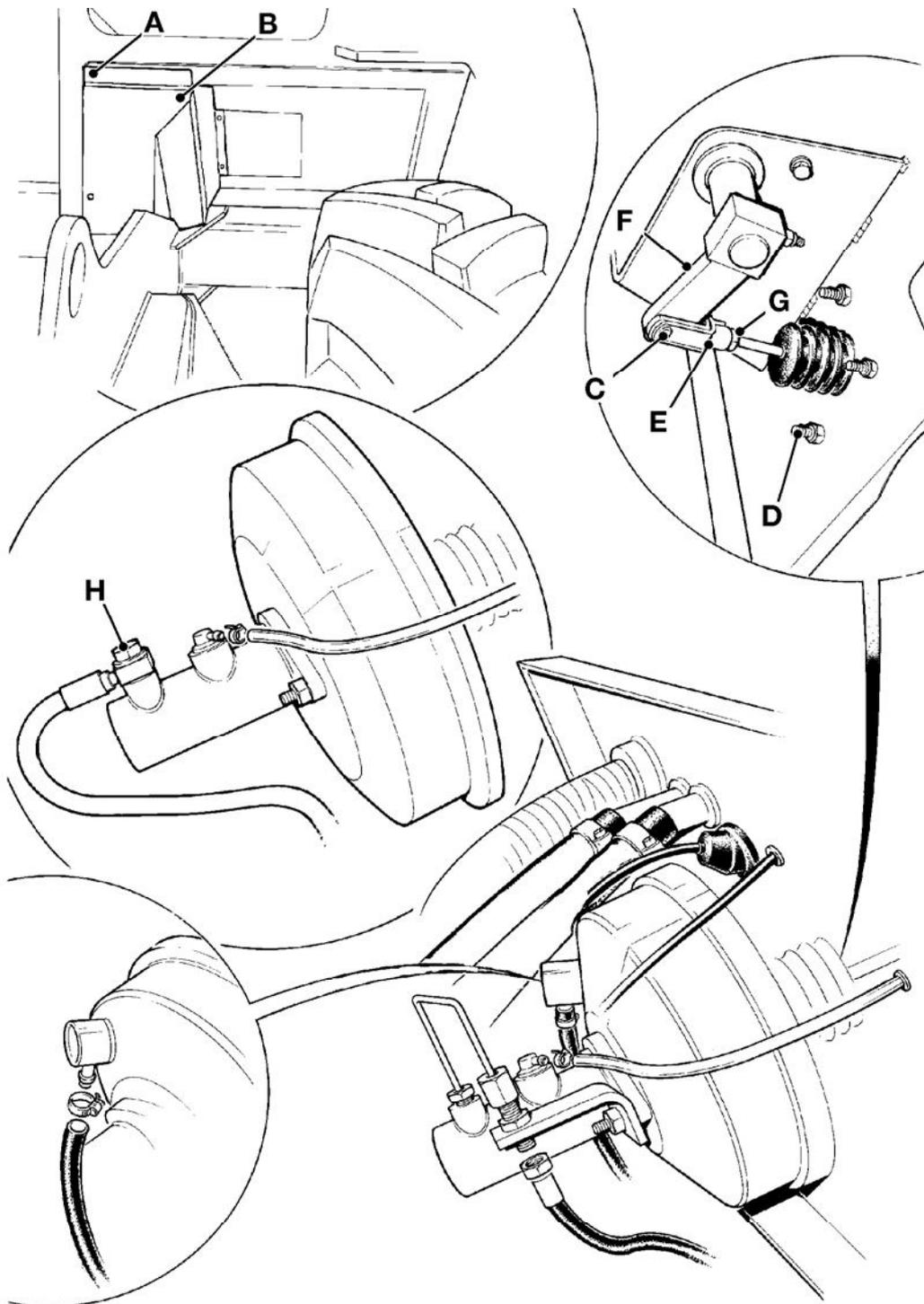


Fig 7. Removal and Replacement

Removal

- 1 Position machine on level ground and apply park brake.
- 2 Chock front and back wheels.
- 3 Undo bolts **7A** and remove brake master cylinder cover plate **7B**.
- 4 Remove panel to right of steering wheel for access to brake lever.
- 5 Remove locking pin **7C** from brake lever.
- 6 Disconnect brake hoses from master cylinder and servo supply hose.
- 7 Remove bolts **7D**.
- 8 Remove brake cylinder with servo from machine.

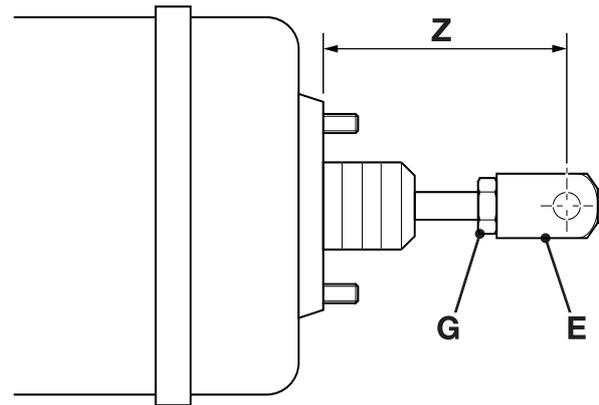


Fig 8.

Replacement

Replacement is reversal of the removal procedure.

Note: Phase banjo fittings as shown on illustration. ⇒ [Fig 7.](#) (□ [G-8](#))

Set the servo master cylinder push rod as follows:

- 1 Adjust clevis **8G** to dimension **8Z** 160 mm (6.45 in).
- 2 With the brake pedal against the back stop and the master brake cylinder push rod fully extended, check that the hole in the clevis aligns with the hole in the brake lever **7F**. Adjust clevis if necessary.
- 3 Install locking pin **7C** and tighten lock nut **7G**.

Bleed brake system after fitting servo and brake master cylinder. ⇒ [Bleeding Procedure](#) (□ [G-6](#)).

Table 1. Torque Settings

Item	Nm	kgf m	lbf ft
7H	30 - 34	3.0 - 3.4	21 - 23

Dismantling and Assembly

Important: Only the master cylinder may be dismantled for re-sealing. If a fault develops in the servo unit it must be renewed.

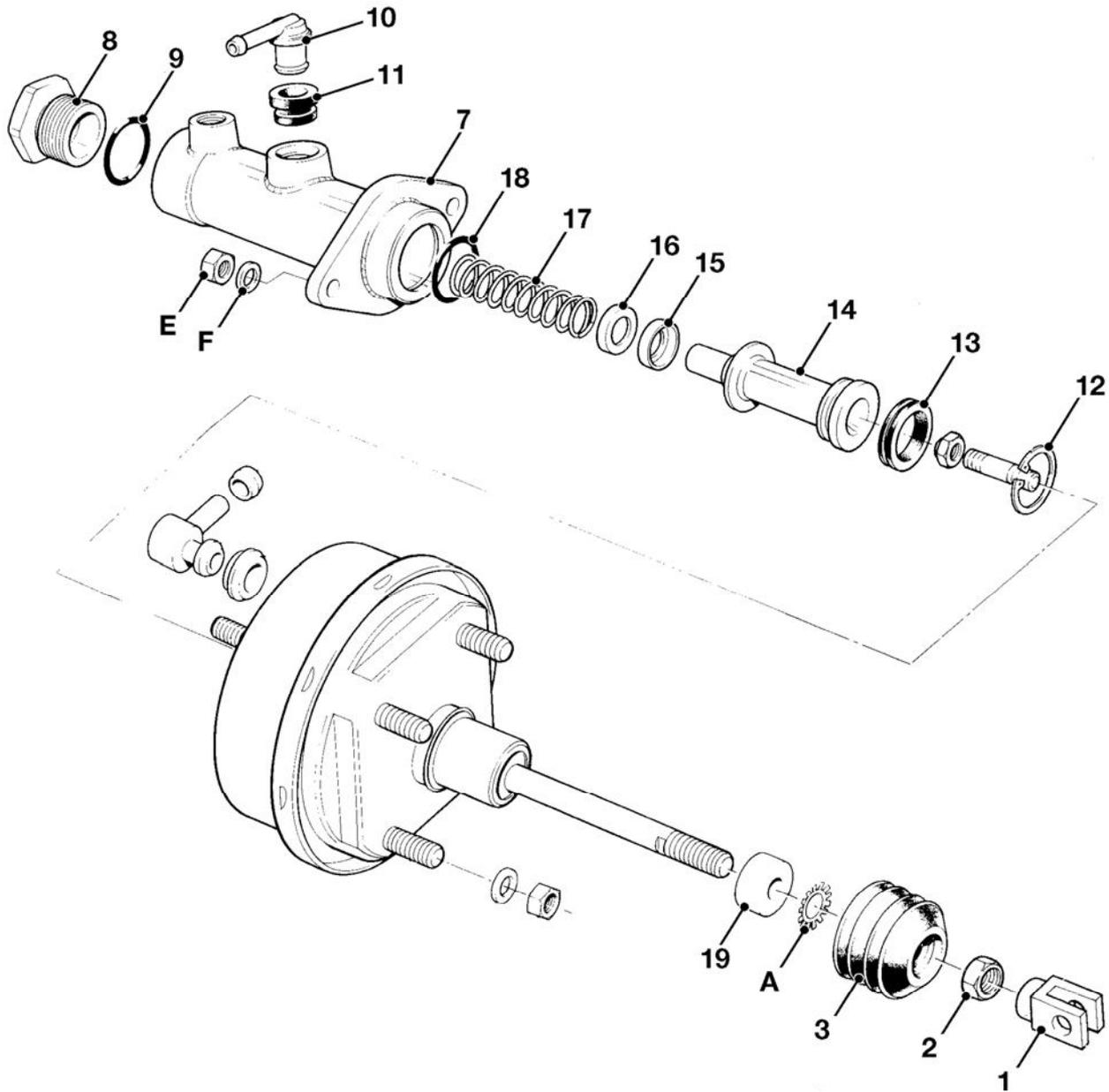


Fig 9. Dismantling and Assembly

Dismantling

⇒ [Fig 9. \(□ G-10\)](#). The numerical sequence on the illustration is intended as a guide to dismantling. For assembly, reverse the sequence.

- 1 Remove clevis **91** and remove lock nut **92**. Remove dust cover **93**.
- 2 Remove nuts **94** to separate master cylinder from servo.
- 3 Shake the cylinder, or use compressed air to eject piston and spring.
- 4 The sponge filter **9-19** can be removed without removing the star washer **9A**. Compress sponge **9-19** and feed through centre hole of star washer **9A**.
- 5 Examine the working surfaces of piston and cylinder. If these are not in perfect condition the complete master cylinder assembly must be renewed.

Assembly

- 1 Renew items **9-9**, **9-11**, **9-13**, and **9-18**. (These should all be supplied in the repair kit.)
- 2 Clean and lubricate all components (including new seals) with JCB Light Hydraulic Fluid.

WARNING

Use of incorrect fluid will cause serious damage to the seals which could in turn cause brake failure.

BRAK-1-1

Take care not to damage machines faces of piston.

Park Brake

Machines up to SN 586873

Renewing the Brake Pads

- 1 Make the machine safe

WARNING

Before adjusting the park brake, make sure that the machine is on level ground. Put blocks each side of all four wheels. Disconnect the battery so that the engine cannot be started. If you do not take these precautions the machine could run over you.

2-3-2-4

- 2 Disengage the park brake lever, (lever horizontal). Turn handle grip to bring pin central in its slot. → [Fig 10.](#) ([□ G-12](#)).

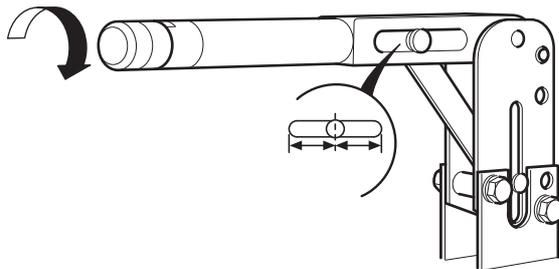


Fig 10.

- 3 Release the park brake cable 11A.
- 4 Remove the calliper adjuster 11B.
- 5 Release nut/bolts 11C sufficiently to disengage spring from callipers.

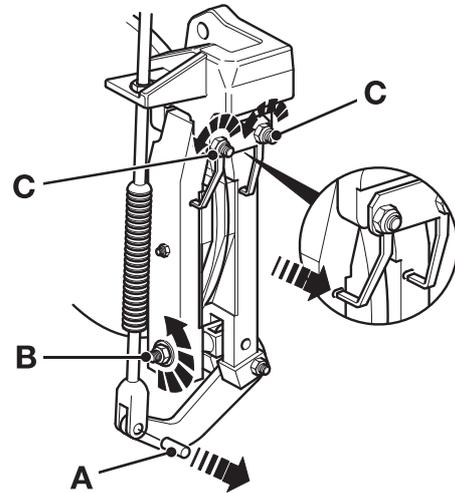


Fig 11.

- 6 Undo and discard brake pad retaining nuts 12A.

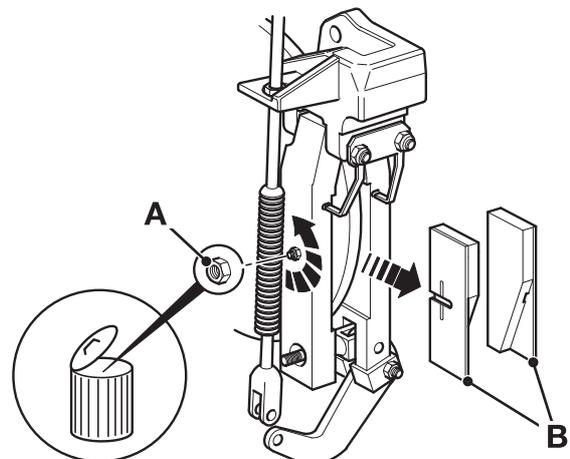


Fig 12.

- 7 Remove both brake pads 12B.
- 8 Pull brake callipers apart 13A.

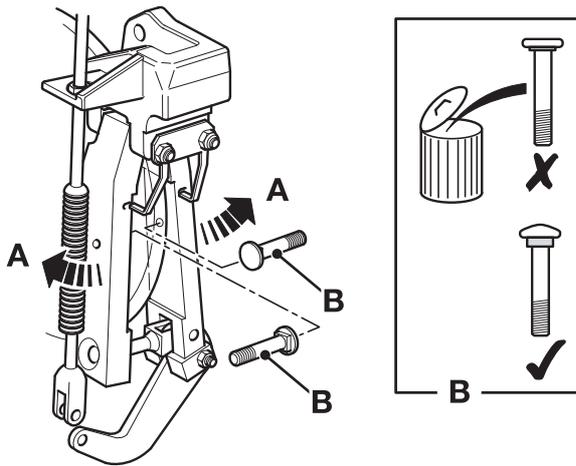


Fig 13.

- 9 Remove and discard brake retaining bolts **13B**, fit new bolts.
- 10 Fit new brake pads **14A**.

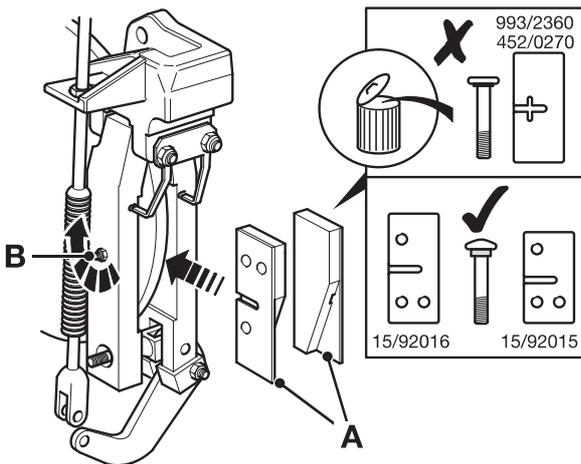


Fig 14.

- 11 Fit and tighten brake pad retaining nuts **14B** to 6Nm (4.4 lbf ft).
- 12 Engage spring in brake callipers and tighten bolts **15A** so that the callipers move freely (14Nm, 10.3lbf ft).

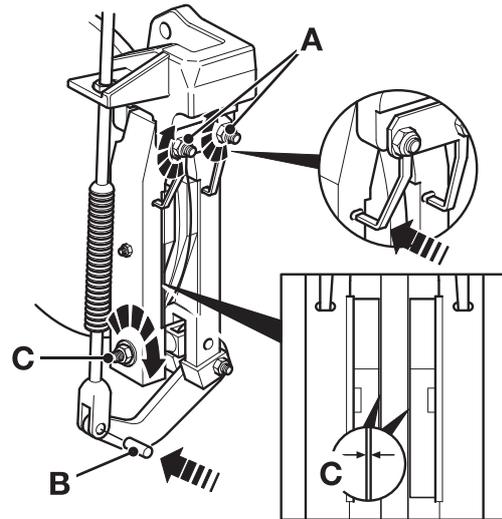


Fig 15.

- 13 Reconnect brake cable **15A**.
- 14 Fit adjuster **15C** and tighten until the pads just touch the brake disc with the park brake lever disengaged (lever horizontal).
- 15 Test the park brake. → [Testing \(G-16\)](#).

Dismantling and Assembly

Dismantling

The numerical sequence on the illustration is intended as a guide to dismantling.

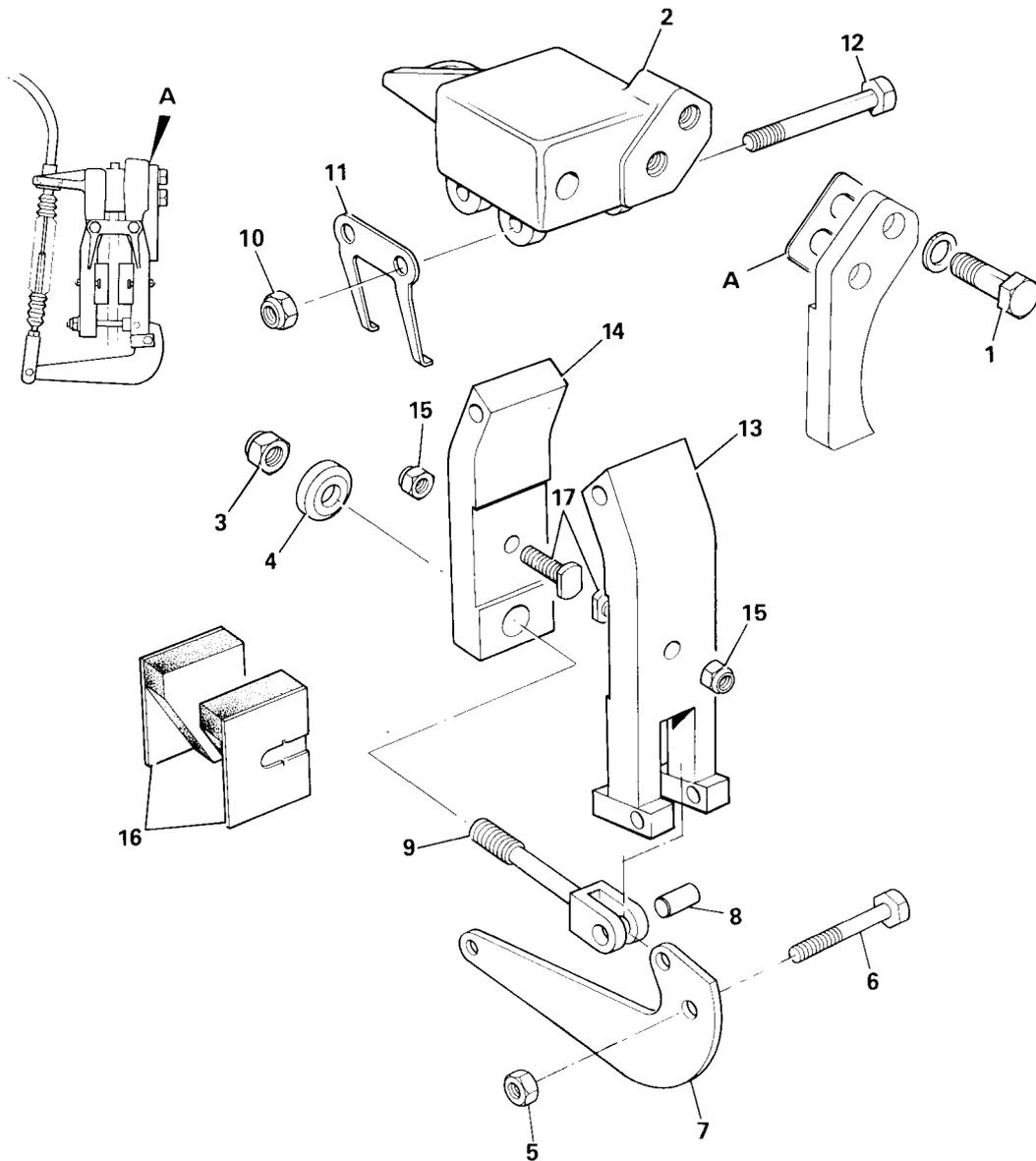


Fig 16.

Assembly

Assembly is the reverse of Dismantling.
⇒ [Dismantling \(□ G-14\)](#).

Note: Apply JCB Threadlocker and Sealer to mounting bolts **16-1** before fitting.

Fit shims **16A** as necessary to align the calliper **16-2** centring to within +/- 0.5 mm (0.020 in) of the brake disc centreline.

Renew the pads if the thickness of the friction material is 3mm (0.125in) or less.

Lightly grease all pivots and working surfaces, taking care not to allow grease to contact the brake pads.

Tighten nut **16-5** sufficiently to allow lever **16-7** to move freely with minimum side clearance.

Table 2. Torque Settings

Item	Nm	kgf m	lbf ft
16-1	118	12.0	87
16-10	20	2.0	15
16-15	6	0.6	4.4

Testing and Adjustment

Testing

Important: Ensure all routine health and safety precautions are observed before operating machines.

WARNING

Before testing the park brake make sure the area around the machine is clear of people.

2-2-4-5

- 1 Enter the machine. Fasten your seat belt (if fitted) and park the machine on a level dry surface.
- 2 Fully apply park brake 17-1.

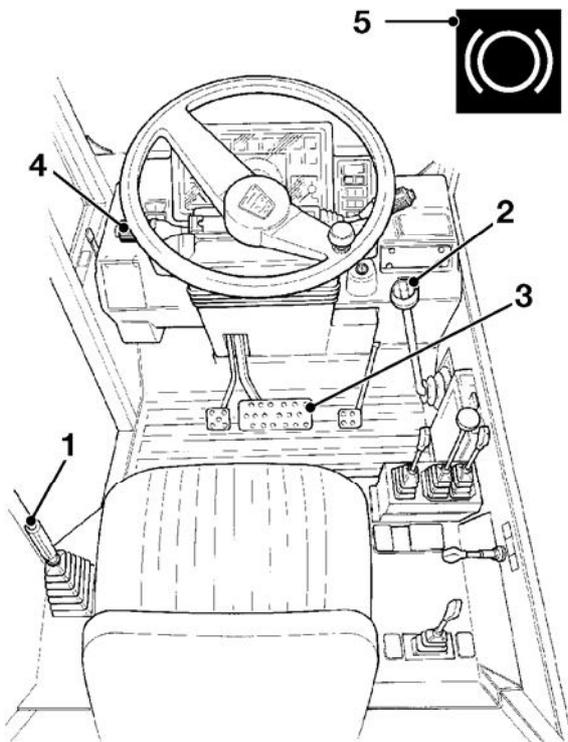


Fig 17.

- 3 Start the engine and raise the attachments to the appropriate travelling position.
- 4 Select fourth gear 17-2.

- 5 Push down hard on foot brake pedal 17-3.
- 6 Select forward drive 17-2.

WARNING

If the machine starts to move during the following test, immediately apply the foot brake and reduce the engine speed.

2-2-5-1

- 7 Test the park brake as follows:
 - a Move the park brake lever fractionally forward until the warning light 17-4 is just extinguished.
 - b Slowly release the foot brake pedal 17-3.
 - c If the machine has not moved, use the accelerator to gradually increase the engine speed to approximately 1500 RPM. The machine should not move.
 - d Do not do this test for longer than 20 seconds.
 - e Reduce engine speed to idle and select neutral 17-2.
 - f Return park brake lever 17-1 to the fully on position from its partially applied position.
 - g Lower attachments and stop the engine.
 - h If the machine moved during the test, adjust the park brake and repeat the test. Be sure to use the correct adjustment procedure for the applicable machine.

WARNING

Do not use a machine with a faulty park brake.

3-2-3-10_2

WARNING

Non approved modifications to drive ratios, machine weight or wheel and tyre sizes may adversely affect the performance of the parking brake.

3-2-3-11

Adjustment

Important: Later machines are fitted with a revised park brake. Always confirm which park brake is fitted to the machine before making any adjustment.

CAUTION

The park brake must not be used to slow the machine from travelling speed, except in an emergency, otherwise the efficiency of the brake will be reduced. Whenever the park brake has been used in an emergency, always renew both brake pads.

4-2-1-1_2

WARNING

Before adjusting the park brake, make sure that the machine is on level ground. Put blocks each side of all four wheels. Disconnect the battery so that the engine cannot be started. If you do not take these precautions the machine could run over you.

2-3-2-4

The park brake should be fully engaged when the lever is vertical. The park brake indicator light should light when the brake is engaged with the forward/reverse lever away from neutral (starter switch at IGN).

WARNING

Over adjustment of the park brake could result in the park brake not fully releasing.

0011

1 Check and Adjust the Pad Position

Measure the pad thickness. If the friction material **18A** is 3 mm (0.125 in) or less, always fit a new set of pads. Check that the pads just touch the disc, shown at **18B**, with the park brake disengaged (lever horizontal).

If necessary, adjust the pad position by turning nut **18C**. Turn the nut clockwise to close the pads onto the disc.

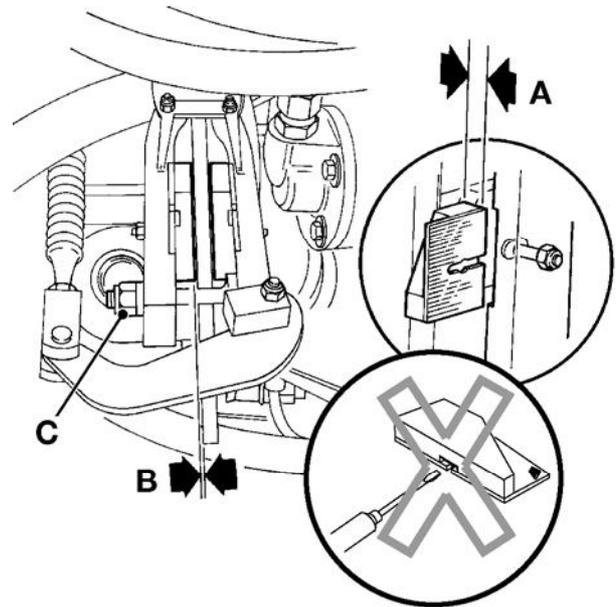


Fig 18.

2 Take Up the Cable Slack

- a Disengage the park brake (lever horizontal).
- b Turn handle grip **19A** clockwise, half a turn.

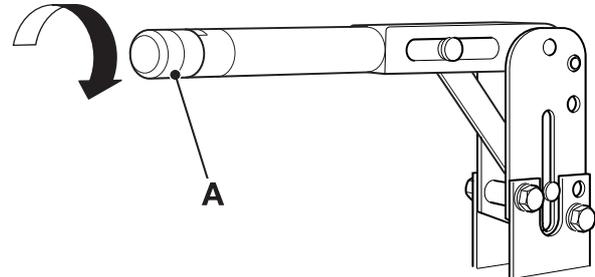


Fig 19.

- c Test the park brake. → [Testing \(□ G-16\)](#).
- d If the brake fails the test, repeat Step 2.

Machines from SN 586874

Brake Calliper

Removal and Replacement

WARNING

This is a safety critical installation. Do not attempt to do this procedure unless you are skilled and competent to do so.

Installation and mounting of the park brake caliper requires tightening of the mounting bolts to a specific torque figure. Do not attempt to do this job unless you have the correct tools available.

0010

WARNING

Before working on the park brake, park on level ground and put blocks on each side of all four wheels. Stop the engine and disconnect the battery so that the engine cannot be started. If you do not take these precautions the machine could run over you.

BRAK-8-8

WARNING

Brake pads generate dust which if inhaled, may endanger health. Wash off the caliper assemblies before commencing work. Clean hands thoroughly after work.

13-3-1-3

Removal

- 1 Release the park brake lever (lever horizontal).
- 2 Note which hole in the operating lever clevis **20A** is attached to and disconnect the clevis.
- 3 Remove clip **20B** and disconnect the cable from the bracket.
- 4 Support the calliper and remove the two mounting bolts and hardened washers **20C**. Lift the calliper clear of the brake disc.

Note: Do not remove transmission mounting bracket **20D** unless it needs to be renewed.

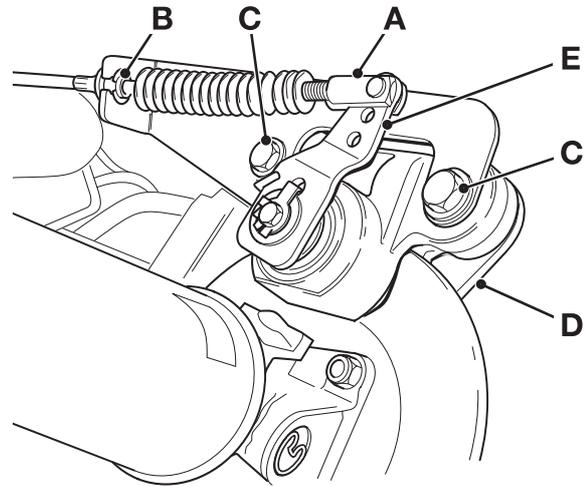


Fig 20.

Inspection

WARNING

Oil on the brake disc will reduce brake effectiveness. Keep oil away from the brake disc. Remove any oil from the disc with a suitable solvent. Read and understand the solvent manufacturer's safety instructions. If the pads are oily, new ones must be fitted.

2-3-2-3_3

- 1 Check the thickness of the friction material on the two brake pads. Renew both brake pads if the thickness of friction material is below 1mm (0.04 in) on either pad.
- 2 Check the condition of the disc surface. Renew the disc if badly warped, pitted or worn.
- 3 Renew the cable if worn or damaged.

Replacement

Replacement is the reverse of Removal.

⇒ [Component Identification \(□ G-21\)](#).

- 1 If transmission mounting plate **20D** has been removed, secure in place using three new verbus rip bolts. These bolts can only be used once. ⇒ [Torque Figures \(□ G-20\)](#).

If the mounting plate has not been removed, check the retaining bolts are tightened as above before proceeding further.

Later machines are fitted with an improved transmission mounting plate which cannot be removed with the brake disc in place. ⇒ [Torque Figures \(□ G-20\)](#).

- 2 Fit lever side pad **21-2**. Position the pad on the face of the rotor **22-9** and carefully press in place on the plastic clip in the centre of the rotor.
- 3 Fit carrier side pad **22-1**. Add a small amount of silicon sealant to the back outer edge of the backing plate to hold the pad in place within the housing.
- 4 Replace the calliper. Fit new mounting bolts **20C** with hardened washers and tighten to 255 Nm (188 lbf ft).
- 5 Make sure floating parts move freely and that all other parts are mounted securely. Tighten all mounting bolts to the recommended torque figures. ⇒ [Torque Figures \(□ G-20\)](#).
- 6 Attach the cable to the mounting bracket and secure in place with clip **20B**.
- 7 Refit the clevis to the relevant hole in the operating lever as follows:

Top Hole - Attach the cable to the top hole of the operating lever only if the cable is fitted with adjusting nuts under the cab.

Middle Hole - Attach the cable to the middle hole of the operating lever if the cable is not fitted with adjusting nuts under the cab.
- 8 Make sure there is adequate freedom of movement of operating lever **20E** to ensure a positive brake

application, and that the lever returns to the rest position when the park brake is released.

- 9 Adjust the park brake. ⇒ [Adjustment \(□ G-25\)](#). Never unscrew the clevis to adjust the cable.

Renewing the Brake Pads

⇒ [Component Identification \(□ G-21\)](#).

- 1 Press carrier side pad **22-1** into housing **22-15** and remove. Ensure any residual silicone used for pad retention during assembly is removed.
- 2 Carefully lever side pad **22-2** from the rotor **22-9** using a flat blade screwdriver. Take care to prevent damage to the plastic clip in the centre of the rotor.

Torque Figures

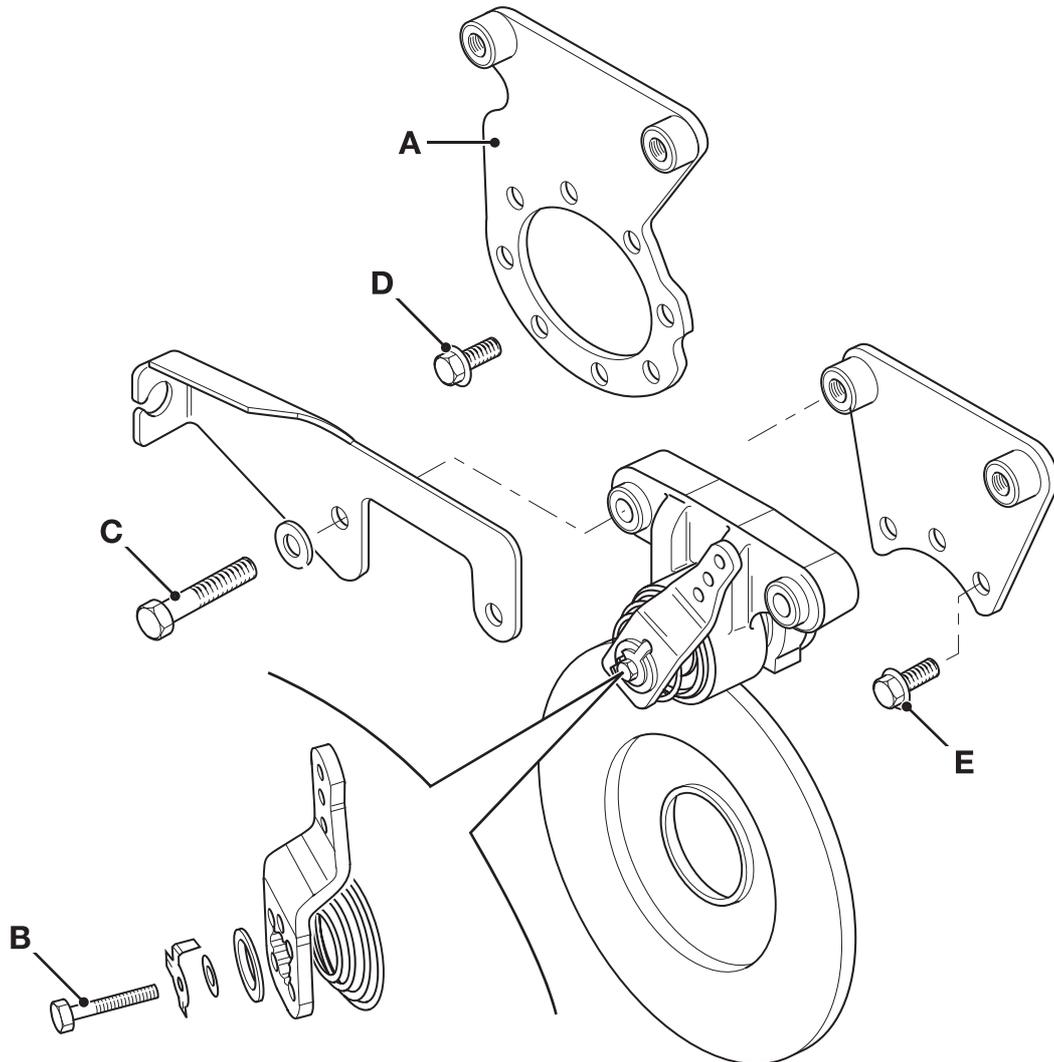


Fig 21. Typical Installation

Where appropriate, the grade of bolt (e.g. 10.9) is indicated. ⇒ [Table 3. Torque Settings \(□ G-20\)](#). Refer also to relevant dismantling and assembly procedures.

Note: Later transmission casings are fitted with improved mounting bracket **21A**. Make sure the bolts securing the bracket are tightened to the correct torque figure shown.

Table 3. Torque Settings

Item	Grade	Nm	lbf ft
21B		13-16	9-12
21C	10.9	255	188
21D⁽¹⁾	12.9	166	122
21E⁽¹⁾		85	63

(1) Always use new bolts.

Dismantle, Inspection And Assemble

WARNING

This is a safety critical installation. Do not attempt to do this procedure unless you are skilled and competent to do so.

Installation and mounting of the park brake caliper requires tightening of the mounting bolts to a specific torque figure. Do not attempt to do this job unless you have the correct tools available.

0010

WARNING

Before working on the park brake, park on level ground and put blocks on each side of all four wheels. Stop the engine and disconnect the battery so that the engine cannot be started. If you do not take these precautions the machine could run over you.

BRAK-8-8

WARNING

Brake pads generate dust which if inhaled, may endanger health. Wash off the caliper assemblies before commencing work. Clean hands thoroughly after work.

13-3-1-3

The internal components of the brake calliper may differ. Where it is necessary to differentiate between the two designs, references will be made to 'Type 1' and 'Type 2.'

Always confirm which park brake is fitted to the machine before making any adjustments. → [Component Identification \(□ G-21\)](#).

Component Identification

→ [Fig 22. \(□ G-22\)](#).

22-1	Carrier Side Pad
22-2	Lever Side Pad
22-3	Screw (Type 2)
22-3A	Bolt (Type 1)
22-4	Washer
22-5	Washer
22-6	Lever
22-7	Spring
22-8	Rotor
22-9	Ball Spacer
22-10	Ball Bearings
22-11	Mounting Bushes (Type 2)
22-11A	Mounting Bushes (Type 1)
22-12	Dust seals (Type 2)
22-12A	O-ring (Type 1)
22-13	Rotor seal
22-14	Bearing ring
22-15	Housing
22-16	Shaft Seal
22-17	Anti-rotation clip (Type 1)

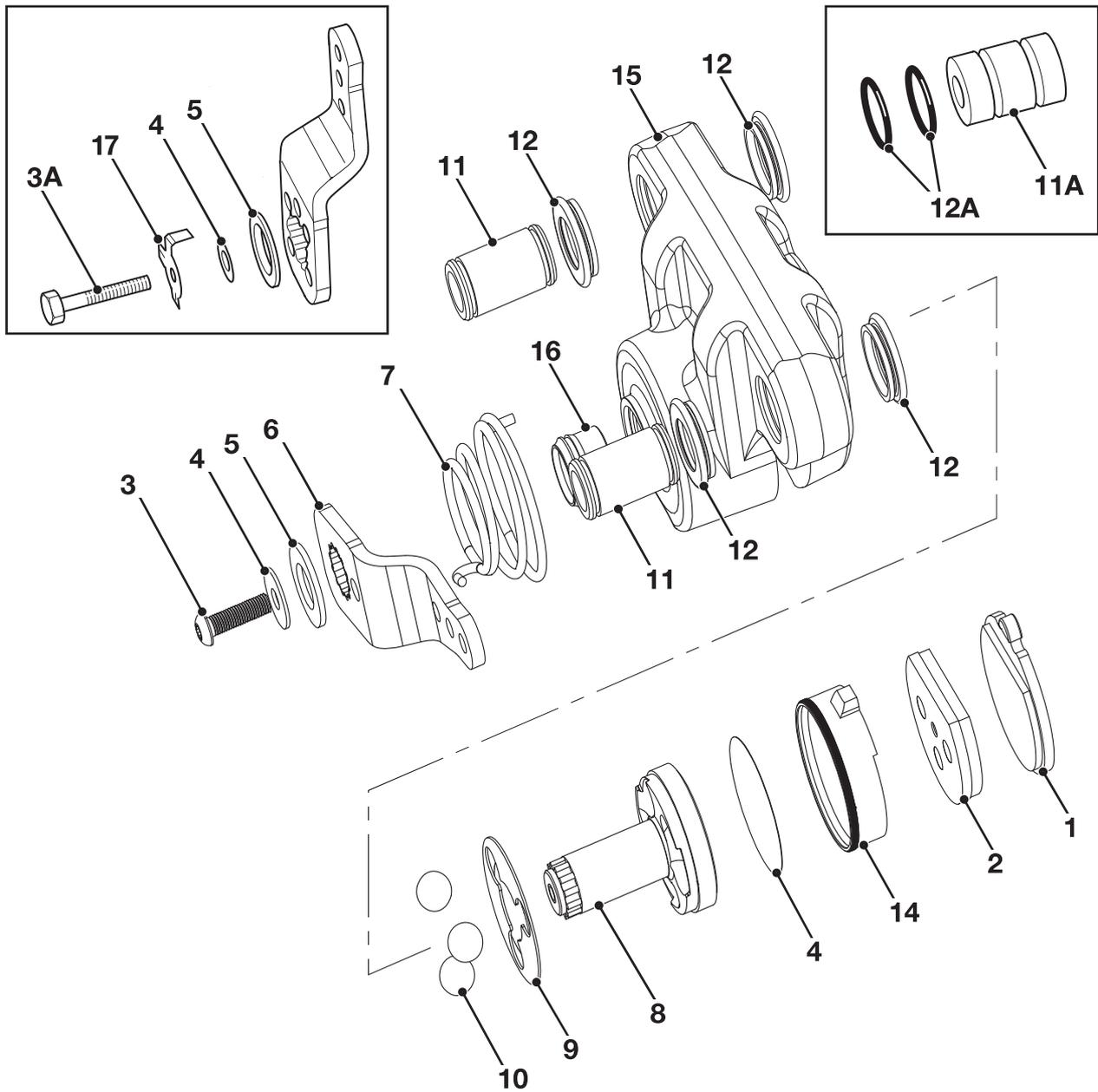


Fig 22. Park Brake Calliper

⇒ [Component Identification \(G-21\)](#).

Dismantle

A numerical sequence, intended as a guide to dismantling, is provided. → [Fig 22. \(□ G-22\)](#).

- 1 Remove the calliper and brake pads. See → [Removal \(□ G-18\)](#).
- 2 Type 1 - Bend the tabs on anti-rotation clip **22-16**. Remove bolt **22-3A**, anti-rotation clip **22-16** and washers **22-5** and **22-6**. Hold lever **22-6** against the tension of the spring as the bolt is removed.

Type 2 - Remove the screw **22-3**, and washers **22-4** and **22-5**. Hold lever **22-6** against the tension of the spring as the screw is removed.
- 3 Note the position of lever **22-6** relative to the splines of the shaft **22-8**. Mark the end of the shaft and lever **22-6** to aid assembly. Remove lever **22-6** and spring **22-7**.
- 4 Push out rotor **22-8** and remove ball spacer **22-9** and ball bearings **22-10**. Take care not to lose the ball bearings.
- 5 Type 1 - Push out mounting bushes **22-11** and remove dust seals **22-12**.

Type 2 - Push out mounting bushes **22-11A** and remove O-rings **22-12A**.
- 6 Remove the rotor seal **22-13** followed by bearing ring **22-14**. Note that the rotor seal may be located on the rotor shaft or may have been left in the calliper housing **22-15**.

Note: Shaft seal **22-16** will not need to be renewed unless excessively worn or damaged. If removal is necessary, press the seal out from inside the housing using a suitable spacer block and bench press. Clean out any remains of the seal after removal.

Inspection

- 1 Clean and dry all parts. Check all parts are free from excessive wear, damage or corrosion. Light scores or stains should be removed. Renew corroded or deeply scored parts.
- 2 Check rotor **22-8** for damage or distortion and renew if necessary.

- 3 Always renew both brake pads if the park brake has been used in an emergency.
- 4 Check the ball pockets in housing **22-15** for signs of scoring, pitting, damage or corrosion. Renew the housing if damaged.
- 5 Check spring **22-7** is not broken or distorted.
- 6 Check the condition of the disc surface. Renew the disc if badly warped, pitted or worn.

Assemble

A numerical sequence, intended as a guide to assembling, is provided. → [Fig 22. \(□ G-22\)](#).

Before assembly make sure all parts are clean and serviceable.

- 1 Fit a new shaft seal **22-16** if removed. Install the seal as shown. Press the seal into the housing using a suitable spacer block and bench press.
- 2 Coat the shaft and ball pockets of rotor **22-8** and the ball pockets of housing **22-15** with silicone grease.
- 3 Insert the three ball bearings **22-10** into the pockets in the housing **22-15**. Insert ball spacer **22-9**.
- 4 Coat the bearing ring **22-14** with silicone grease and fit the ring to the inner diameter on rotor seal **22-13**. Assemble the rotor seal to the rotor **22-8**.
- 5 Slide rotor **22-8** through the housing and seat the ball pockets against the bearings.
- 6 Position spring **22-7** over the shaft of rotor **22-8**. Insert the large diameter end of the spring into hole **23A** in the face of the housing.
- 7 Locate the small diameter end of spring **22-7** around the outside edge of lever **22-6** as shown at **23B**.

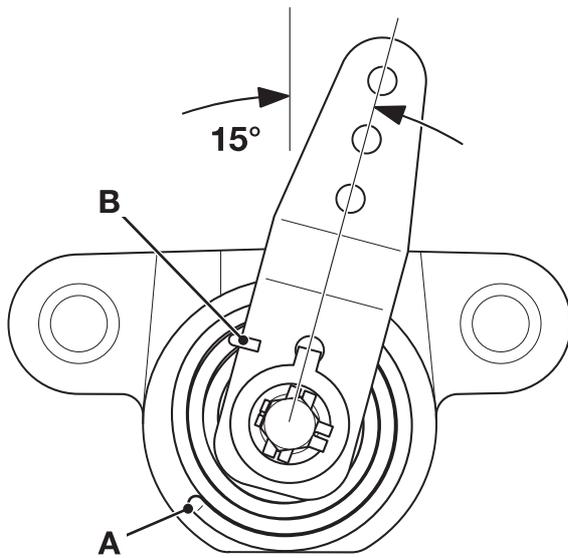


Fig 23.

- 13 Before fitting the calliper, ensure the lever rotates smoothly and that the lever side pad **22-2** returns to the off position when the lever is released.
- 14 Refit the brake calliper. [⇒ Replacement \(□ G-19\)](#).
- 15 Adjust the park brake. [⇒ Adjustment \(□ G-25\)](#).

Table 4. Torque Settings

Item	Nm	lbf ft
22-3 (Type 2)	13-16	9-12
22-3A (Type 1)	13-16	9-12

- 8 Fit lever **22-6**. Align the lever to the mark made during dismantling. [⇒ Fig 23. \(□ G-24\)](#).

- 9 Type 1 - Hold the lever against the tension of the spring and fit washers **22-4** and **22-5**, and new anti-rotation clip **22-17**. Fit bolt **22-3A** and torque tighten. [⇒ Table 4. Torque Settings \(□ G-24\)](#)

Type 2 - Hold the lever against the tension of the spring and fit washers **22-4** and **22-5** Fit screw **22-3** and torque tighten. [⇒ Table 4. Torque Settings \(□ G-24\)](#).

- 10 Type 1 Only - Bend up a tab on the anti-rotation clip that aligns with one of the flats on the bolt.
- 11 Fit the new brake pads. [⇒ Renewing the Brake Pads \(□ G-19\)](#).
- 12 Type 1 - Lubricate the O-rings **22-12A** and bushes **22-11A** with silicone grease. Fit O-rings into the housing and insert mounting bushes. Wipe off any excess grease.

Type 2 - Lubricate the dust seals **22-12** and bushes **22-11** with silicone grease. Fit the dust seals to the housing and insert mounting bushes. Make sure that the dust seals locate in their location grooves on the bushes **22-11** and housing **22-15**. Wipe off any excess grease.

Testing and Adjustment

Testing

⇒ [Testing \(□ G-16\)](#).

Adjustment

Lever Adjustment

The park brake must be fully engaged when the lever is vertical. The park brake indicator light must illuminate when the brake is engaged with the forward/reverse lever away from neutral (starter switch at IGN).

Later machines may be fitted with alternative parkbrake lever **24A**. Squeeze the release lever under the hand grip and lower the park brake forward to release.

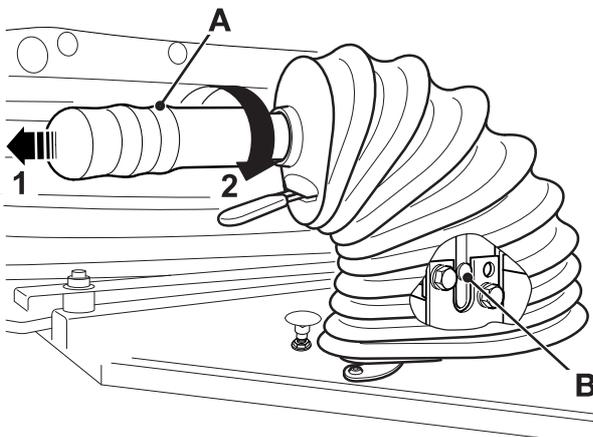


Fig 24.

- 1 Test the park brake. ⇒ [Testing \(□ G-16\)](#). Adjust the park brake as described below if the machine moved during the test.
- 2 Disengage the park brake (lever horizontal).
- 3 Pull and turn hand grip **24A** clockwise, half a turn.

Note: The park brake fitted to earlier machines (up to SN 1184871) does not have the detent position. To adjust the park brake, turn the handle grip clockwise (half a turn).

- 4 Test the park brake.

- 5 If the brake fails the test, repeat Steps 2 and 3. If there is insufficient adjustment using the park brake lever. ⇒ [Cable Adjustment \(□ G-25\)](#).

Cable Adjustment

⚠ WARNING

Before working on the park brake, park on level ground and put blocks on each side of all four wheels. Stop the engine and disconnect the battery so that the engine cannot be started. If you do not take these precautions the machine could run over you.

BRAK-8-8

Renew the cable and check the pad thickness if adjusting nuts are not fitted. ⇒ [Brake Calliper \(□ G-18\)](#).

Always renew a worn or damaged cable.

- 1 Disengage the park brake (lever horizontal).
- 2 Set the handbrake lever mechanism to the centre of its adjustment position:
 - a Early type park brake lever. ⇒ [Fig 25. \(□ G-25\)](#).

Turn hand grip in direction shown to centre pin **25A** in its slot.

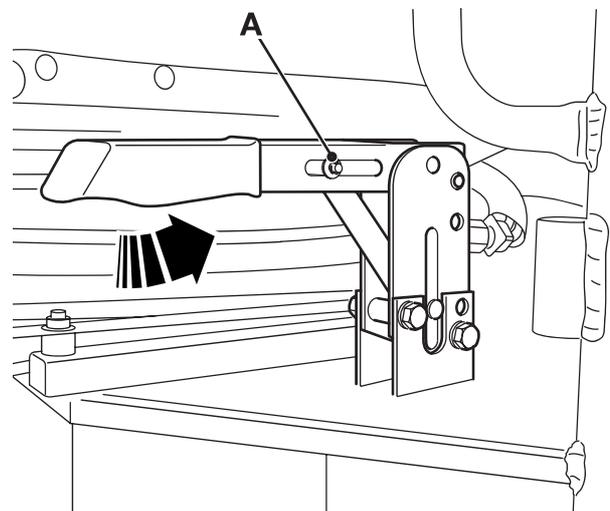


Fig 25. Early Type Park Brake Lever

- b Later type park brake lever. ⇒ [Fig 26. \(□ G-26\)](#):

- i Release the park brake.
- ii Fully adjust the hand grip.
- iii Turn the hand grip in the direction shown to position the mechanism at the centre of its adjustment (approximately 15 turns from the fully adjusted position).

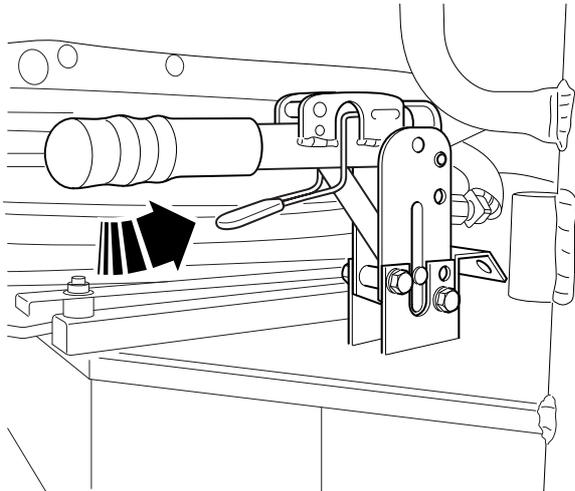


Fig 26. Later Type Park Brake Lever

- 3 Release the two locknuts at **27A** and adjust the cable length as required. Renew both brake pads if there is insufficient adjustment at the cable. Renew the cable if there is still insufficient adjustment after new pads have been fitted.

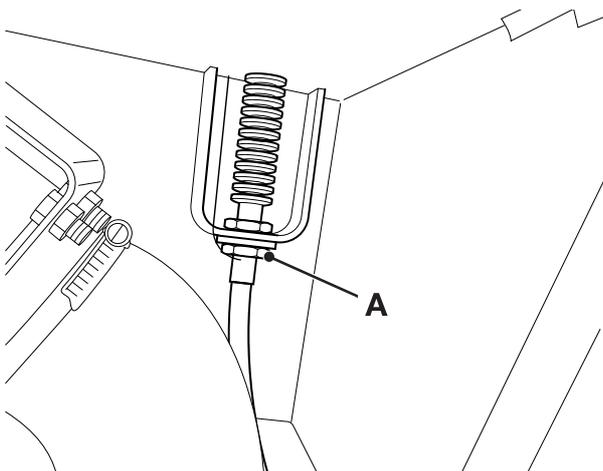


Fig 27.

- 4 Make sure there is adequate freedom of movement of operating lever **28A** to ensure a positive brake application, and that the lever returns to the rest position when the park brake is released.

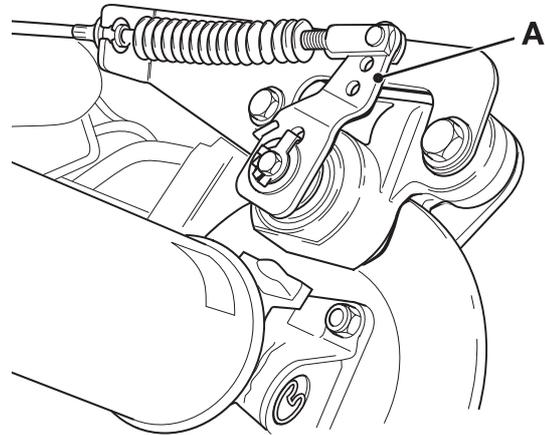


Fig 28.

Note: If a new cable is fitted, position the threaded section of the cable with approximately four threads visible below the bottom adjusting nut.

- 5 Test the park brake. Make final adjustments at the park brake lever if the brake fails the test. → [Lever Adjustment \(□ G-25\)](#).