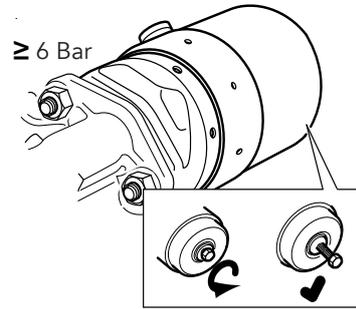
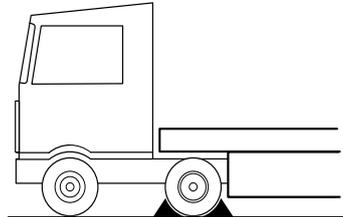


Maintenance

Always ensure the vehicle is securely chocked on level ground before releasing the parking brake. Cage the spring brake or use a minimum hold off pressure of 90 psi (6 bar).



Regular Checks

Regular brake inspection is an important part of vehicle maintenance and should take place every 3 months.



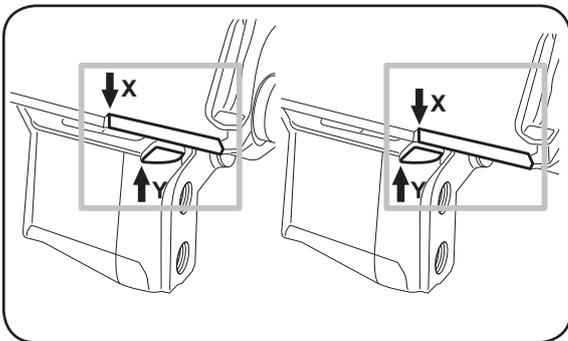
'These check frequencies are a minimum and, depending on the vehicle application, a more frequent check may be necessary. Refer also to vehicle manufacturer's instructions with regard to check frequencies and service intervals for brake calipers, brake pads, brake discs and air chambers'

Regular Checks

Brake Pad Wear

A visual assessment of brake pad wear should be made – independent of any wear indicator fitted to the vehicle. There are two methods of carrying out a quick and simple assessment of the approximate pad life remaining without removing the wheel.

Method 1



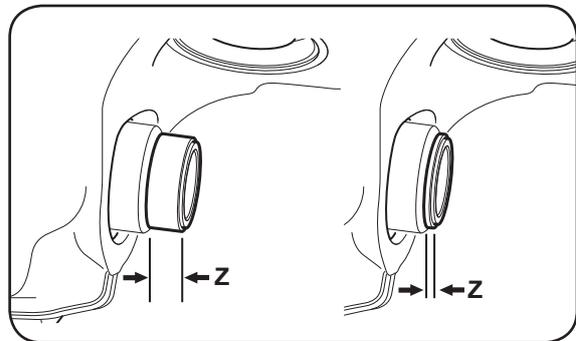
Compare the position of the caliper marking X with respect to the carrier marking Y. If the positions of X and Y are similar to those shown in the right hand diagram then the brake pad and the brake disc thickness should be checked with the wheel removed.

If the visual assessment indicates the pads are approaching their maximum wear allowance then a full check with wheel removed should be made. Brake pads should be replaced when the friction lining C has worn to a thickness of 2.0 mm or less.

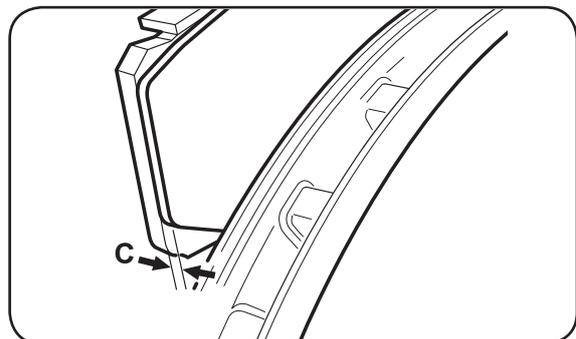


You must always replace the brake pads on both brakes across an axle.

Method 2



Compare the position of the caliper with respect to the end of the short guide sleeve, where applicable. If dimension Z is less than 1 mm then the brake pad and the brake disc thickness should be checked with the wheel removed.



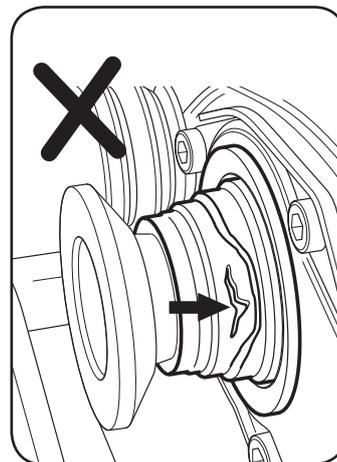
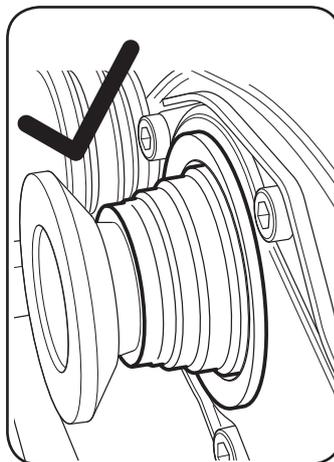
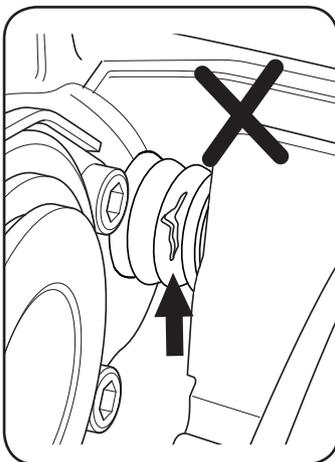
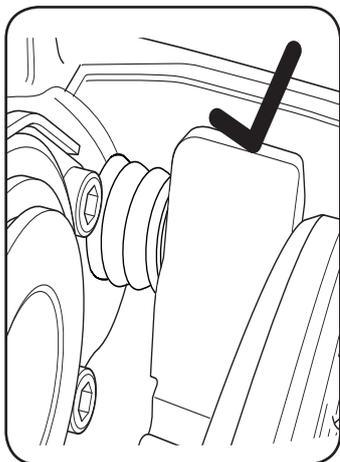
Regular Checks

Corrosion

Visually inspect the brake for damage or corrosion, paying particular attention to the guide sleeve boots and tappet boots. Check that the adjuster cap is correctly fitted. If in doubt follow the additional checks in this maintenance procedure and if necessary replace any damaged parts using the relevant MEI service kit.

Guide Sleeve Boots

Tappet Boots



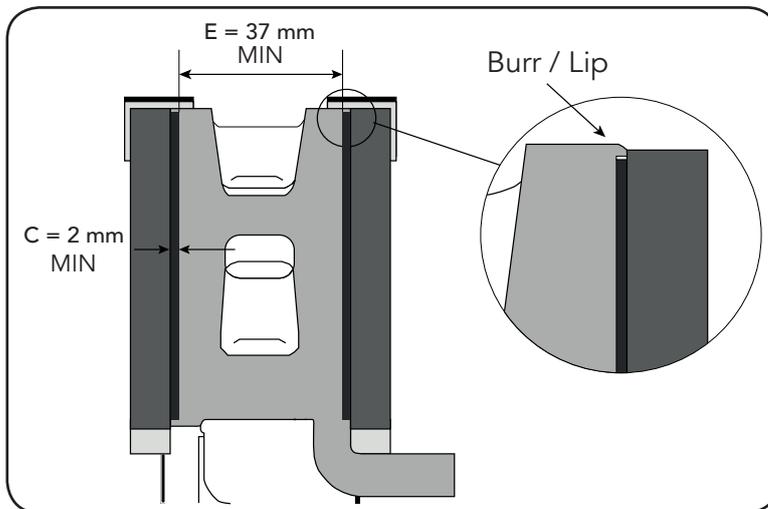
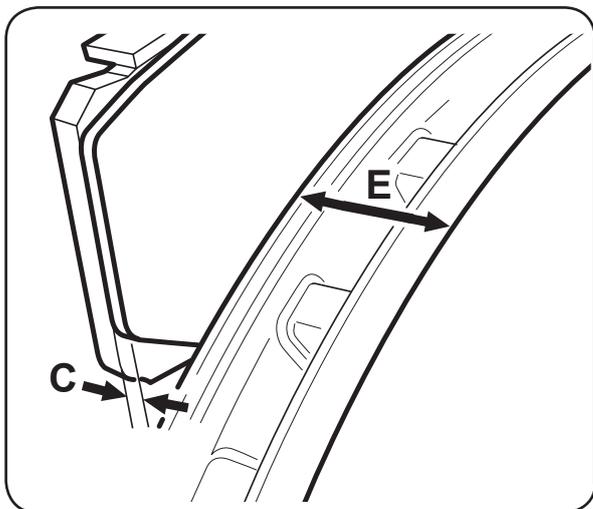
Regular Checks

Brake Disc

Measure the thickness of the brake disc at its thinnest section – brake discs should be replaced when the overall thickness E has worn to 37.0 mm or below.

Be aware of possible burrs or lips at the outer edge when checking the disc thickness.

'The brake discs should be checked according to the vehicle manufacturer's specification, looking for signs of heavy grooving, cracking or corrosion'



If disc thickness E is less than 39 mm it is recommended that the disc should be replaced when the brake pads are changed.

You must always replace the brake discs on both wheels across an axle. Ensure old brake pads and discs are disposed of in accordance with local environmental regulations.

Operational Checks

Operational checks should be carried out annually or at every pad replacement. It is important to check the brake adjuster is functioning correctly and that the caliper slides smoothly over its full range of travel.

Operational Checks

Adjuster Function

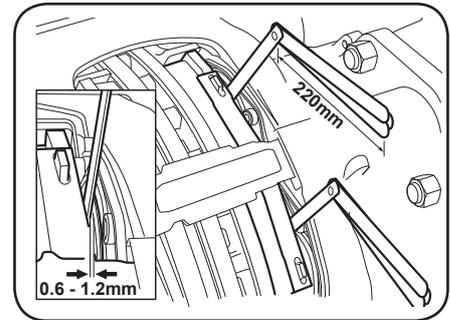
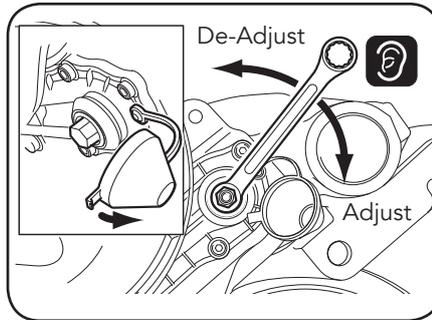
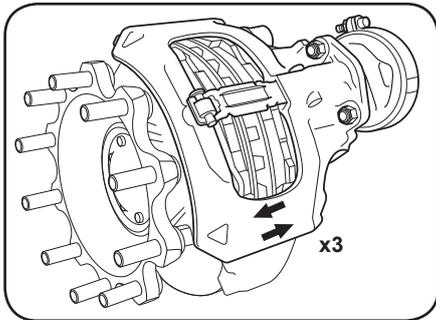
Ensure that service brake and parking brake are in the released condition – always ensure the vehicle is securely chocked before releasing the parking brake. Push and pull caliper 3 times in an axial direction to assess the running clearance between pads and disc. If the caliper does not move then check the condition of the guide sleeve bushes. Remove the adjuster cap and fit new pads. Set the clearance by turning the adjuster anti-clockwise with a suitable 10 mm ring spanner or socket wrench, and then turn clockwise until 1.3 mm running clearance has been achieved, measured between the tappet heads & inboard pad, ensuring there is no clearance at the outboard pad.



Never exceed a maximum torque of 25 Nm in either direction, and never use power tools.

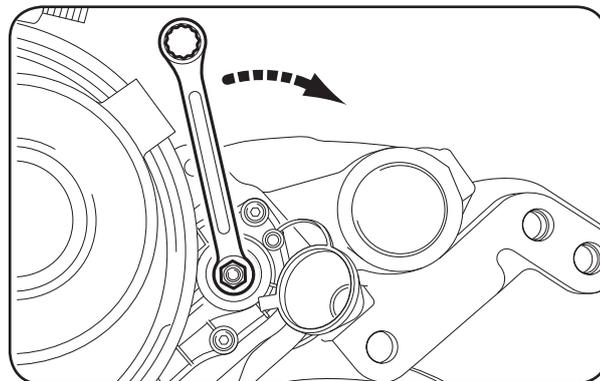
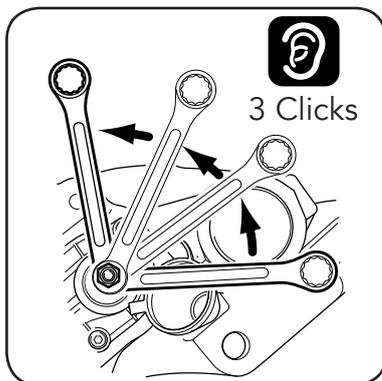


'Note that when turning the adjuster anti-clockwise a noticeable clicking should be heard & felt'



Apply the brakes 20 times with 2 bar maximum pressure. Measure the clearance between each tappet head and the inboard pad backplate – this should be measured over the whole surface of both tappet heads simultaneously using two feeler gauges at least 220 mm long.

The running clearance between each tappet head and inboard pad backplate must measure between 0.6 - 1.2 mm. If the difference between the running clearance at each tappet head is more than 0.25 mm then check the condition of the guide sleeve bushes.



If the running clearance is bigger than 1.2 mm then the adjuster must be checked as follows;

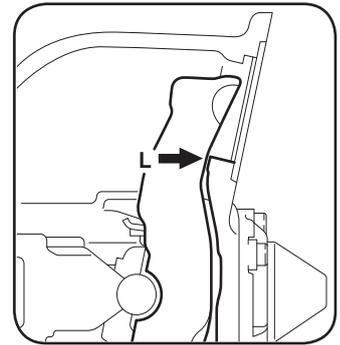
- Turn the adjuster anti-clockwise by 3 clicks to increase the running clearance.
- Position a ring spanner or socket wrench onto the adjuster as a visual aid, as shown, ensuring there is sufficient clearance for it to move freely.
- Apply the brake 5 to 10 times (2 bar maximum pressure) and the ring spanner should turn clockwise in small increments (as viewed from the air chamber side). Note that as the number of applications increases then incremental movement of the spanner will decrease.
- If the ring spanner does not turn, or turns only with the first application, or turns forward and backward with every application, then there is a problem and the caliper must be replaced.

Operational Checks

Adjuster Function

If the running clearance is smaller than 0.6 mm then the caliper must be checked as follows;

- Remove the air chamber and check that the lever is in contact against the caliper housing (see arrow "L").
- Remove the brake pads and if necessary, remove dirt from the brake pads, carrier & caliper;
 - Check the brake pads for wear from the tappet heads. If necessary replace the brake pads.
 - Check for wear of the pad contact areas of the carrier and if necessary replace the carrier.
 - Check the brake disc for wear or damage and if necessary replace the disc.
- Check caliper slides smoothly over its full range of travel (see Caliper Sliding check).
- Refit the brake pads and the air chamber. Repeat the adjuster function check. If the running clearance is still smaller than 0.6 mm then the caliper must be replaced.



If the running clearance is too big there is a risk of reduced brake performance and brake failure. If the running clearance is too small there is a risk of overheating and subsequent damage.

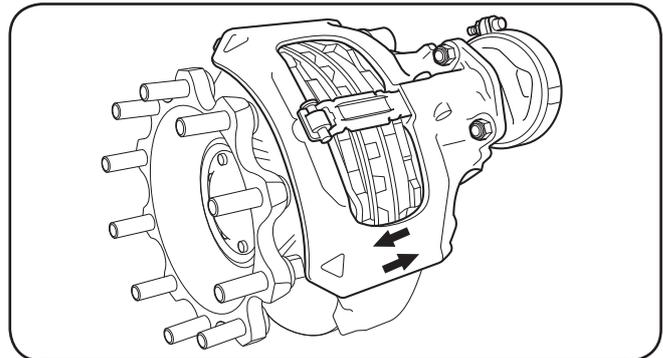


'Opening the caliper or removing the adjuster will invalidate the warranty'

Operational Checks

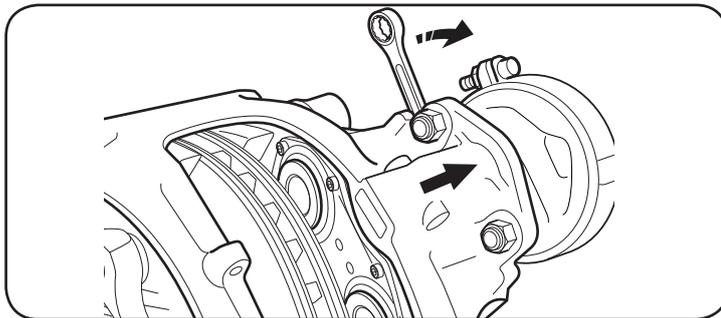
Caliper Sliding

Ensure that the service brake and parking brake are in the released condition – always ensure the vehicle is securely chocked before releasing the parking brake. Push and pull the caliper, by hand, in an axial direction within the running clearance between pads and disc. If, even using a high level of hand force, the caliper is not sliding then examine the guide sleeve sealing components.



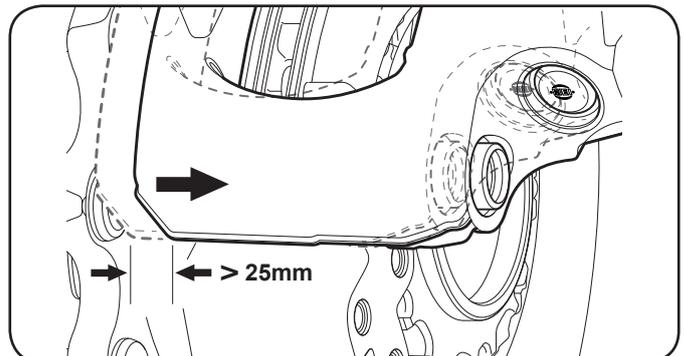
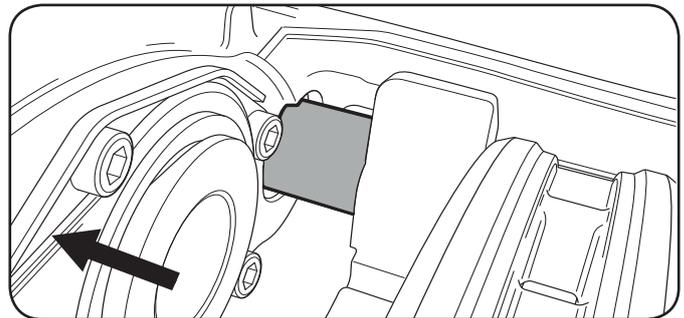
Take care not to trap fingers when sliding the caliper.

For the open short guide sleeve variant (Type B), firstly clean the protruding area of the guide sleeve from outside the caliper. If necessary remove any light corrosion using an abrasive cloth, then lightly apply grease (ref. 5F1500) to the guide sleeve.

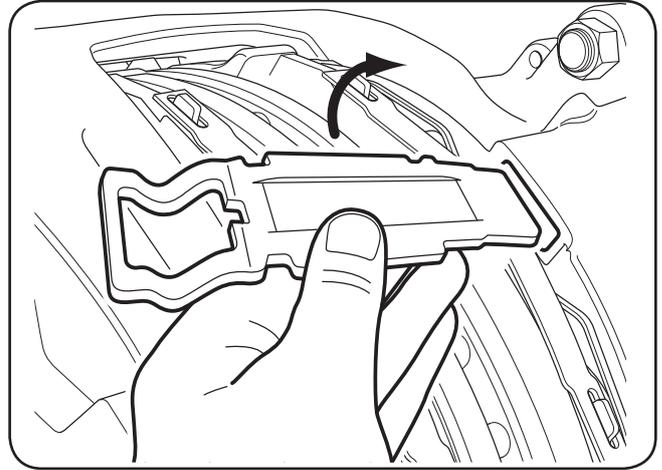
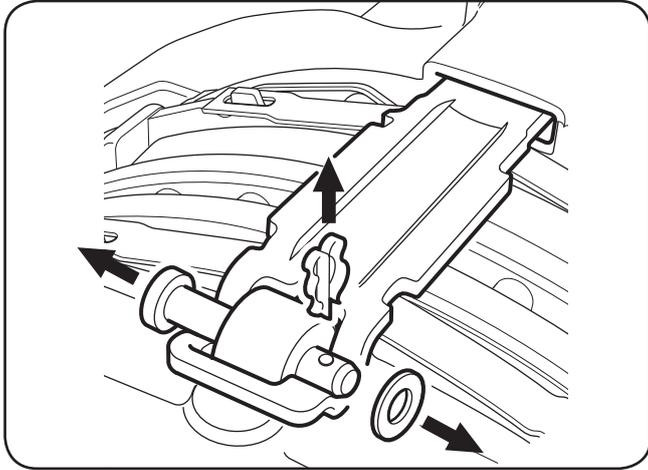


Remove the brake pads and fully wind back the tappets, using a 10mm ring spanner or socket wrench. Push the caliper inboard toward vehicle centre. For the open short guide sleeve variant (Type B), clean the guide sleeve from the inner area of the caliper then lightly apply grease (ref. 5F1500) to the guide sleeve.

The caliper must slide freely along the whole length of the guide sleeve, with movement greater than 25 mm when the pads are not present. If the caliper does not move at least 25 mm, then examine the guide sleeve sealing components.



Remove the pad retainer by first removing the spring clip and washer. Then depress the pad retainer to remove the pin. If necessary remove any pad wear indicator cable and clips (making note of the cable arrangement for re-fitting).

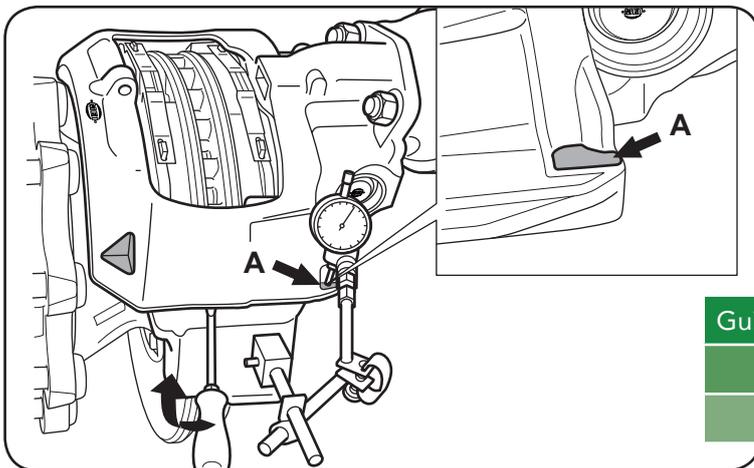


 Depending on the orientation of the caliper the brake pads could fall out when removing the pad retainer.

Remove the brake pads, and replace with a pair of new pads to locate the caliper in the correct position in relation to the carrier. If the guide sleeve bush clearance check is not taking place during a brake pad replacement, the relative positions of the assembled pads must be noted so that they can be re-assembled in the same relative positions.

 'The easiest time to check this is when changing pads.'

Fasten a magnetic dial gauge indicator to the carrier on the short guide sleeve side of the caliper and use the casting feature A on the caliper as the measurement point.



Guide Sleeve Bush Variant	Maximum Clearance
Type B (open)	2mm
Type C (sealed)	1mm

Push the caliper in the direction of the carrier and set the dial-gauge to zero. Place a suitable tool (300 mm max. length e.g. a screwdriver) centrally between the carrier and the caliper. Lever them in opposite directions, using light hand force, to read the maximum value of the bush clearance on the dial gauge.

If the measured bush clearance exceeds the given maximum value in the table then the guide sleeve bushes need to be replaced using the relevant MEI service kit.

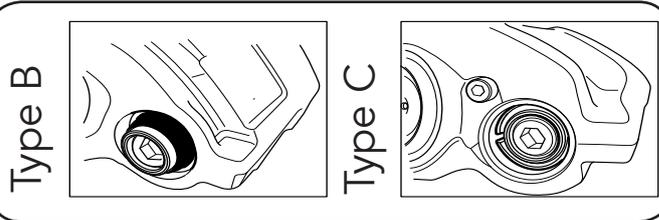
If the clearance check is not taking place during a brake pad replacement, the new pads should be removed and the original brake pads fitted in their previously noted positions. Adjust the running clearance by turning the adjuster clockwise until the pads come into contact with the disc – do not exceed 25 Nm whilst doing this. Turn the adjuster back anti-clockwise 3 clicks and check the pad-to-disc running clearance. Re-fit the adjuster cap, pad retainer and any in-pad wear sensor components.

Operational Checks

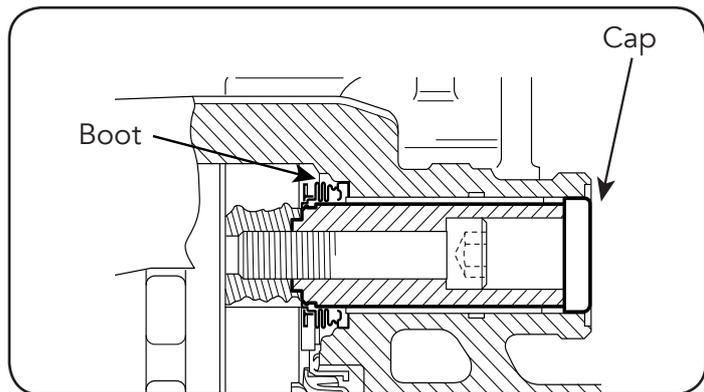
Sealing Components

Guide Sleeve Boots

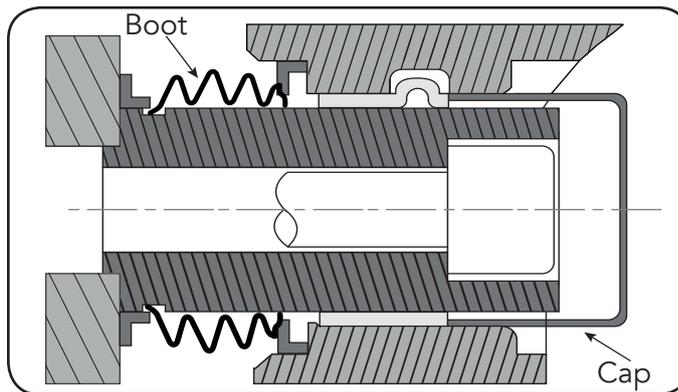
On Type B only the long guide sleeve is sealed with an inner boot and a protective cap.
 On Type C the short guide sleeve is also sealed with an inner boot and a protective cap (cap not shown for illustrative purposes).



Long Guide Sleeve Side



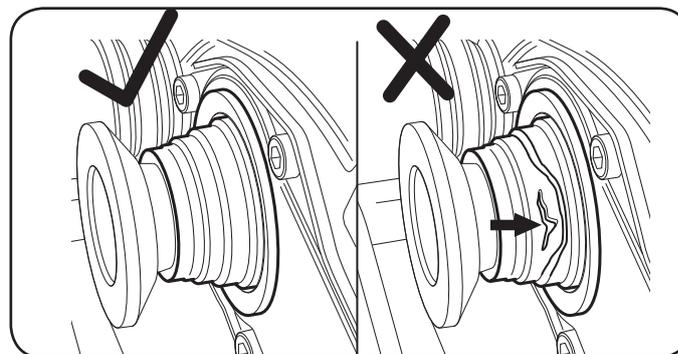
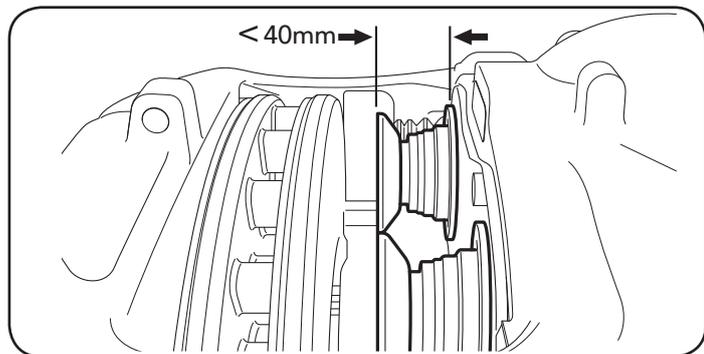
Short Guide Sleeve Side



Inspect the protective caps for correct fitment and any signs of damage. Remove the brake pads to inspect the condition of the guide sleeve boots. If the guide sleeve boots or caps are damaged replace them using the relevant MEI service kit.

Tappet Boots

With the brake pads removed, adjust the tappets using a ring spanner or socket wrench on the adjuster until the boots are clearly visible. The tappets must not be extended more than 40 mm.



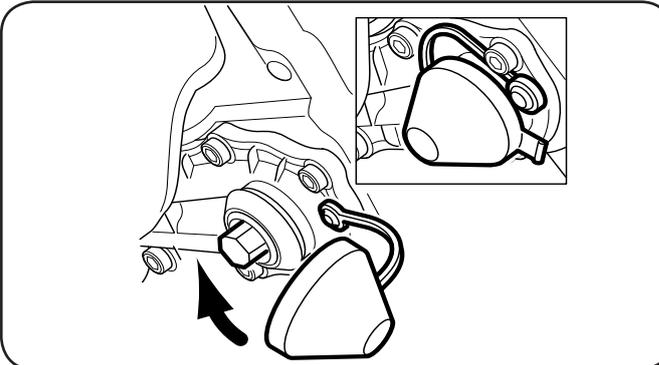
Inspect the condition of the tappet boots. If the tappet boots are damaged replace them using the relevant MEI service kit.

'A little rotational free play of the tappet head is normal and a good indication that the sealing is intact'

Adjuster Cap

Check for correct fitment and condition of the adjuster cap.

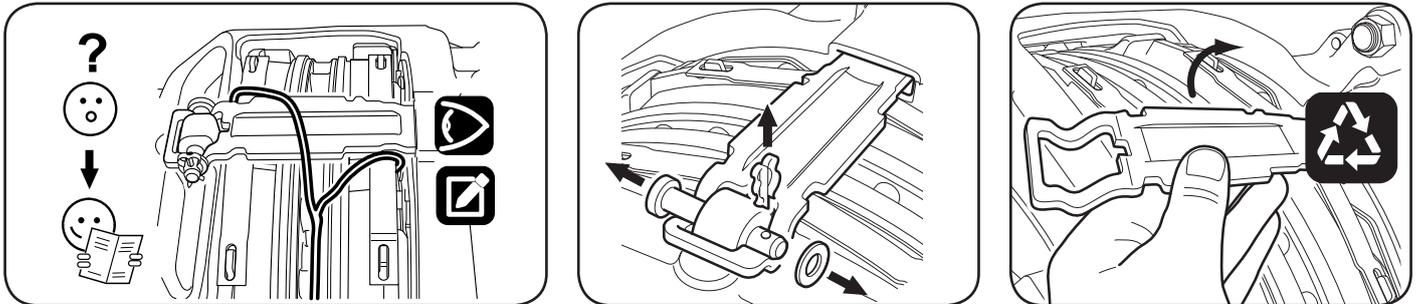
If the cap is damaged or missing replace the adjuster cap using the relevant MEI service kit.



Pad Replacement

Remove the wheel (referring to the vehicle manufacturer's recommendations). Remove the pad retainer by removing the spring clip and washer then depressing the pad retainer to remove the pin. If necessary remove any pad wear warning indicator (PWWI) cable & clips (note the cable arrangement for fitting a new PWWI).

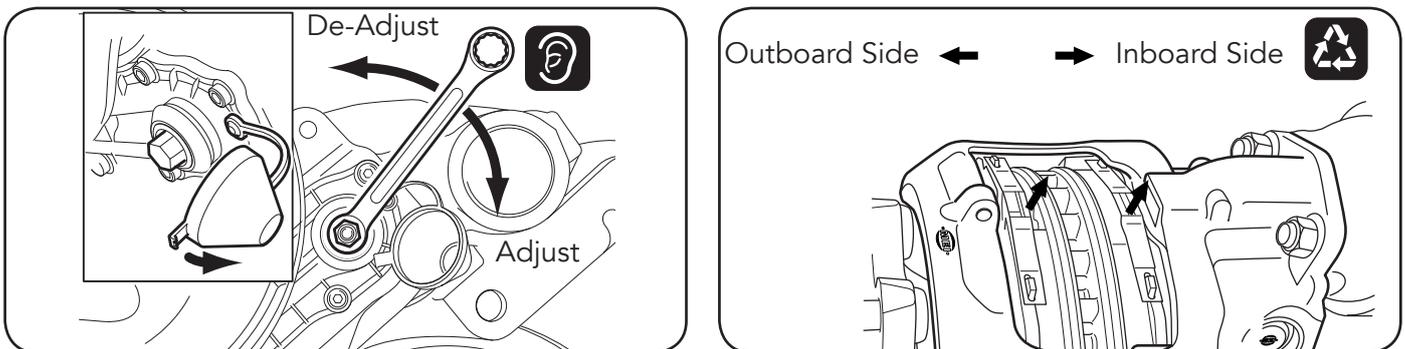
Depending on the orientation of the caliper the brake pads could fall out when removing the pad retainer.



Remove the adjuster cap. Fully wind back the tappets, using a 10mm ring spanner or socket wrench, by turning the adjuster anti-clockwise as viewed from air chamber side.

Never exceed a maximum torque of 25 Nm in either direction, and never use power tools.

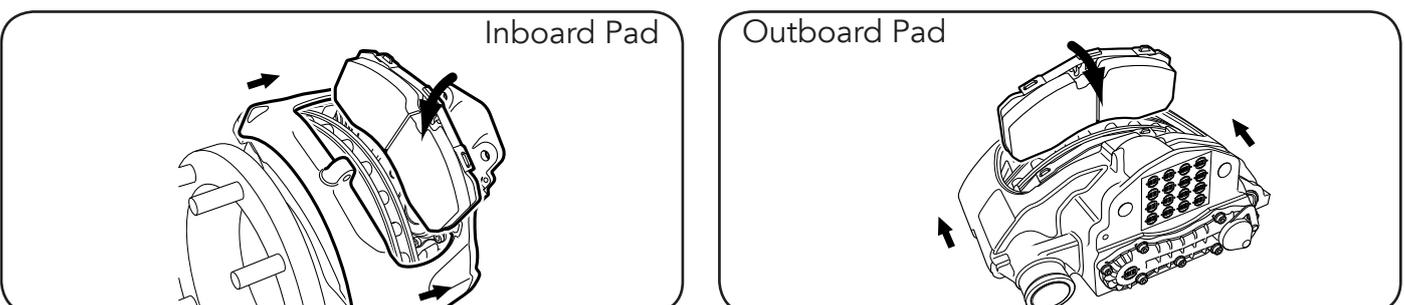
'Note that when turning anti-clockwise a noticeable clicking can be heard & felt'



Remove the worn brake pads and then check the caliper sliding. Note that the geometry of the LC225 brake requires that the caliper is pulled towards the outboard side first in order to remove the outboard pad and then pushed towards the inboard side to remove the inboard pad.

Check the rubber boots and replace if necessary. Clean the pad abutments of the carrier if required, taking care not to damage the rubber boots. Check the brake disc thickness and for signs of heavy grooving, cracking or corrosion.

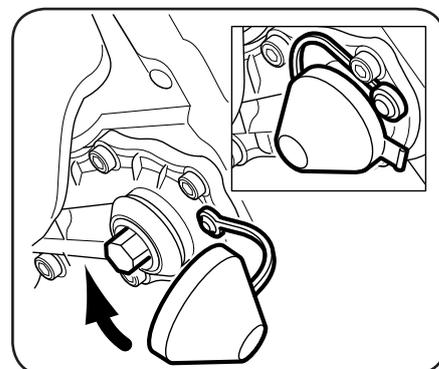
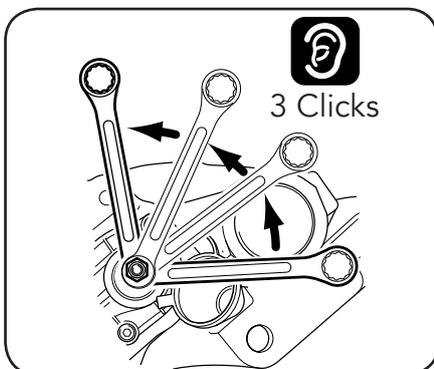
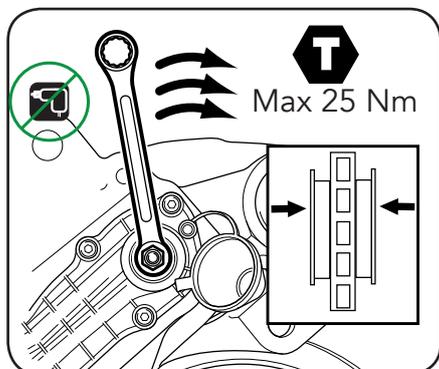
Fully wind back the tappets using a 10mm ring spanner or socket wrench by turning the adjuster anti-clockwise as viewed from air chamber side and fit the new brake pads. Note that the geometry of the LC225 brake requires that the caliper is pushed towards the inboard side to fit the inboard pad first and then pulled towards the outboard side to fit the outboard pad.



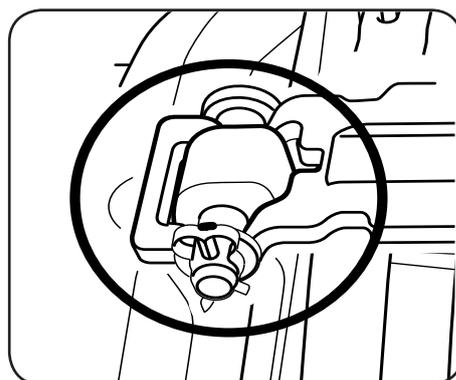
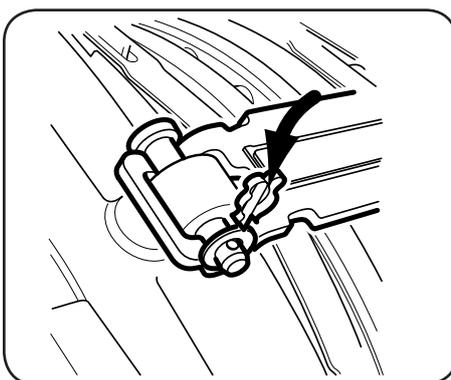
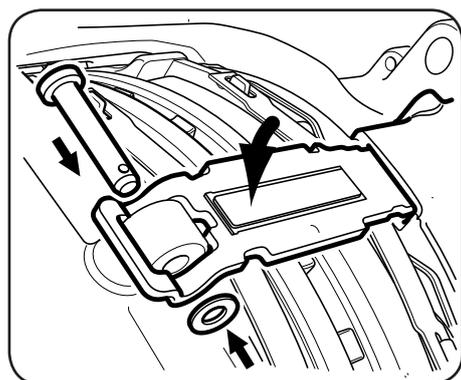
You must always replace the brake pads on both brakes across an axle.
Ensure old brake pads are disposed of in accordance with local environmental regulations.

Pad Replacement

Turn the adjuster clockwise until the pads come into contact with the disc – do not exceed 25 Nm torque. Turn back the adjuster anti-clockwise 3 clicks and check the pad-to-disc running clearance – there should be free rotation of the disc. Refit the adjuster cap.

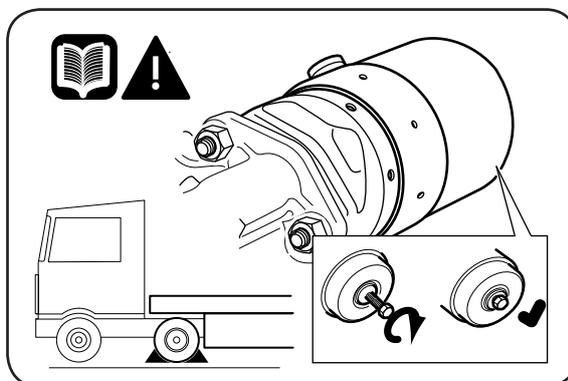
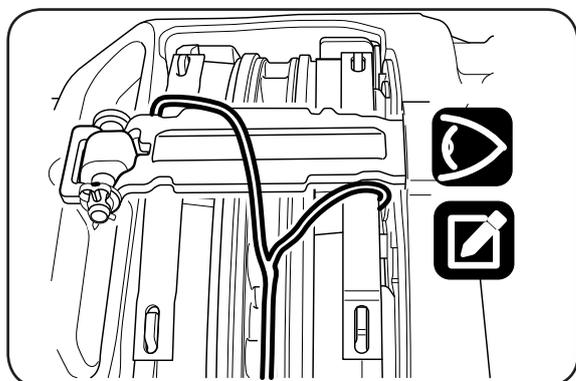


Locate the new pad retainer in the slot in the caliper and depress to enable the insertion of the pad retainer pin. Locate the washer over the pad retainer pin, then press the clip through the pad retainer pin to secure.



'It is recommended that pad retainer pin, where possible, is installed with pin head uppermost'

If applicable, fit a new pad wear warning indicator (PWWI) cable & clips in the same orientation as they were removed.



Replace the wheel in line with the vehicle manufacturer's recommendations. Uncage the spring brake and apply the parking brake prior to removing the chocks from the vehicle. After releasing the parking brake, apply the brake 10 times then road test the vehicle to bed the pads and check the brake performance.

Remember that there may be a lower performance during the bedding-in phase of the new brake pads.