

# AIR DISC BRAKE INSTALLATION GUIDE



Remanufactured ADB22X & ADB22X-V

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## Important information

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Trademarks, model numbers, manufacturer names and other identifiers appearing in this guide are the properties of their respective owners and are used here solely for purposes of reference and identification.

## General safety

### **WARNING**

**This manual is for the exclusive use of trained and qualified professionals in the commercial vehicle industry, working within properly equipped facilities.**

Provide this manual to the person(s) responsible for installing, operating and maintaining the equipment described herein.

Read this manual and observe all proper safety protocols before attempting any inspection, removal or replacement procedure described in this manual.

### **CAUTION**

**Always block the vehicle (chock) wheels before working on any part of an air brake system. Completely drain the vehicle's air brake system and leave all reservoir drain fitting(s) open during installation.**

### **WARNING**

**Haldex recommends technicians and shop personnel take all necessary steps to minimize their exposure to brake dust and airborne brake pad particles.**

## Removing disc brake

If the disc brake is equipped with a parking brake function, ensure that the spring brake chamber is fully caged in the released position (please see the vehicle manufacturer's instructions for more information).

1. Raise the axle to be worked on until the tire is off the ground and remove the wheels.
2. Remove the pin retention clip and washer from the Pad Retainer bar.
3. Press against the Pad retainer bar and remove the pin
4. Remove the adjuster cap, and using a 10mm wrench, turn the adjuster (shear nut tool) counterclockwise until adequate space opens for pad removal.
  - \* If the shear nut adapter breaks more than twice, check whether the parking brakes are caged or released. If released, replace the caliper. The shear nut is designed to shear when the caliper is frozen internally.
  - \*\* Note that a clicking noise will occur while turning the adjuster counterclockwise.
5. Disconnect the air hose(s) at the brake chamber.
6. Remove two of the three attaching bolts on each side of the caliper.

### **CAUTION**

7. **Connect a lifting strap or chain with a suitable lifting device to secure the caliper.**  
**DO NOT use the pad retainer as a lifting point.**
8. Remove the two remaining attaching bolts and lift to remove the disc brake caliper.

## Checking brake rotor

See your rotor manufacturer's instructions for inspection criteria. If a rotor is unusable, replace it immediately.

### Rotor Inspection Tips

1. Look for wear, damages, and cracks on the brake rotor surfaces. Cracks that enter the cooling ducts via the outer or inner radius are not permitted.
2. Using a micrometer or slide caliper, measure the rotor's thickness in the center, middle and outer edge. If the rotor has a wear ridge, the measurement can be performed using 2 spacers (B) (ex- .25 in (5mm) thick flat washers). Reduce the measured dimension by the total thickness of the two spacers. Replace rotor if thickness varies more than 0.005 in between any two points.

Minimum permitted thickness of a brake rotor is 1.5 in (37 mm). Replace rotors that exceed the wear limit. If resurfacing is necessary, be sure at least 0.060 in of material remains above the minimum disc thickness for operating wear.

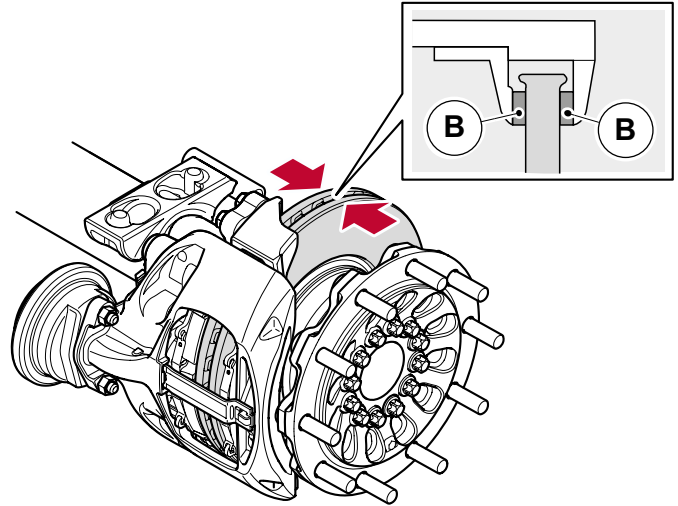
In addition to regular surface wear, disc brake rotors are subject to extreme temperature and torque on every application – and are often exposed to dirt, grease, salt, chemicals and other vocational hazards. The following notes will help you identify and address rotor conditions before they become problems.

### Martensite Spotting

Extreme heat may cause changes to the metallic substructure of a rotor. Rotors may develop Martensite; dark heat spots on the rotor that are hard, raised and brittle. Replace rotors in this condition.

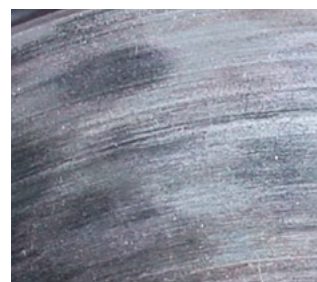
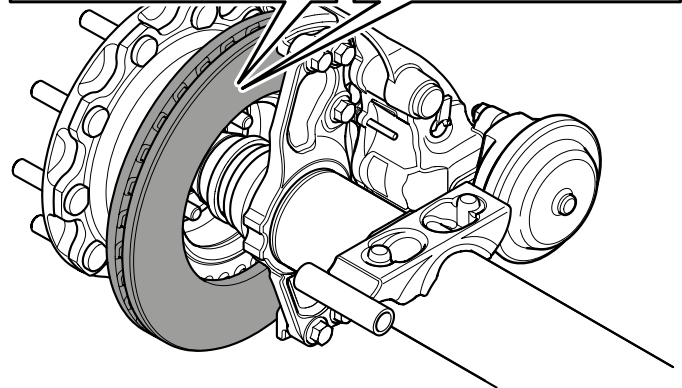
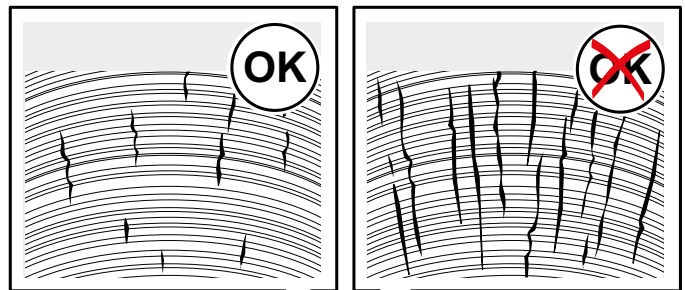
### Lining Transfer

High operating temperatures or improper lining material may result in brake lining transfer, in which a layer of pad material becomes welded to the rotor surface. Remove buildup by resurfacing or replace the rotor.



Acceptable crack length;  
less than 75% of disc width

Unacceptable crack length;  
more than 75% of disc width

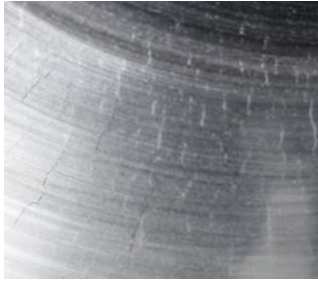


Martensite spotting

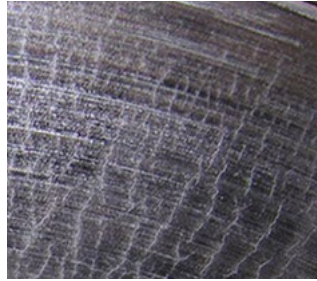


Lining transfer





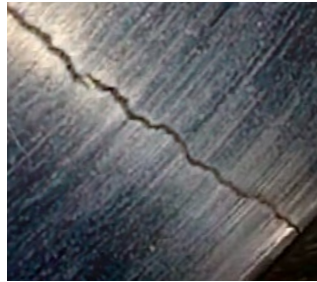
Light heat checking



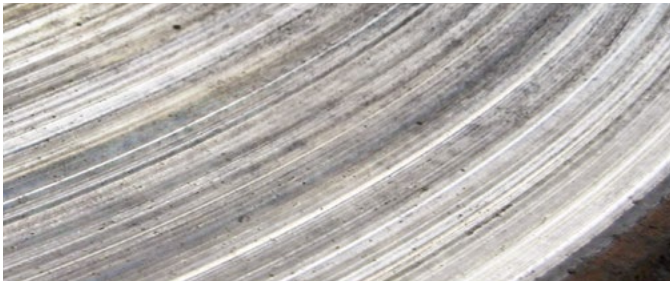
Heavy heat checking



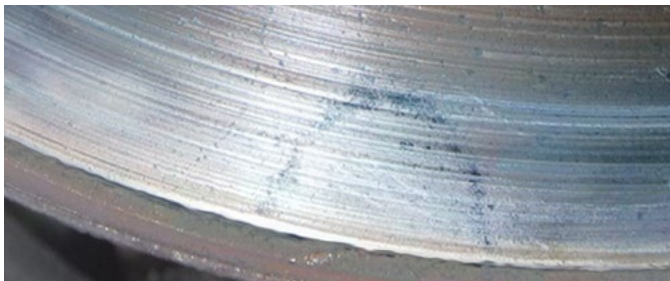
Acceptable cracking



Unacceptable cracking



Grooving and scoring



Bluing and banding



Polishing

## Heat Checking

Checking is a common condition caused by repeated heating and cooling of braking surfaces. Heat checks are short, thin, radial interruptions resembling multiple small and medium-size cracks in the braking surface.

## Cracking

Heat checks may wear away with use or may become actual cracks or fractures in the rotor disc.

Replace rotors if cracks become over 0.060" wide, over 0.060" deep or extend over 75% of the disc surface.

Rotor cracking is caused by mishandling, brake imbalance, wear beyond thickness tolerance, or improper operation. Replace rotor if a crack extends through the disc or the mounting section.

A cracked rotor that is still considered operational should be re-inspected regularly to ensure a crack has not expanded.

## Grooving and Scoring

Scores or grooves are often caused by contaminants between linings and rotors, worn linings, or lining plate contact. Replace rotor if the groove exceeds 0.060" deep or compromises minimum thickness for the disc.

## Bluing and Banding

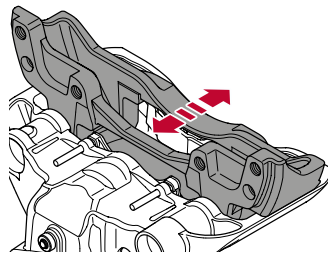
Brakes operate at high temperatures. But continued improper operation or adjustment may cause rotors discoloration with blue marks or bands. It is not necessary to replace discolored rotors that still meet thickness specifications, but the cause of overheating should be identified and repaired.

## Polishing

Polished rotors exhibit a mirror-like braking surface which may be caused by lightly dragging brakes, improper pad selection, or a resurfacing that is machined too finely. To correct polishing, sand the disc surface and brake pads with 80 grit emery cloth to a finish between 120 and 150 RMS.

## Installing disc brake caliper

1. Check that the mounting surfaces to the axle torque plate, brake chamber and pads are clean and free of debris.
2. For axial mounted calipers, check anchor plate mounting surfaces for warpage. If anchor plate has warpage, replacement may be recommended.
3. Remove plastic tie strap from the caliper – strap is used only for pre-install shipping and handling.
4. Check carrier bracket for sliding movement before installation. Slide from the center of the carrier back and forth checking for free movement.



### CAUTION

5. **Connect a lifting strap or chain with a suitable lifting device to lift the disc brake into position. DO NOT use the pad retainer for a lifting point.**
6. Gather recommended mounting hardware if applicable, use new bolts and washers (see table 1.1.)
7. Fit one bolt on each side of the caliper assembly and pre-torque bolt to 20 – 60 ft-lbs. Reference the torque pattern table for the mounting style (see table 1.2.)
8. Remove the lifting strap or chain from disc brake.
9. Fit the other 2 bolts on each side and pre-torque each bolt to 20 – 60 ft lbs. Reference the torque pattern table for the mounting style (see table 12.)
10. Torque all bolts according to the vehicle OEM specifications (see table 1.3.)
11. Using hand pressure on the long guide pin side of the caliper (where push point sticker is applied), push the caliper back and forth on the guide pins. Check for free movement.

## Mounting Hardware

Caliper Style	Bolt Size / Washer
Vertical Mount	M16x2.0x110, Class 10.9 plain or oil finished. Washer not required
Axial Mount	M20x2.5x60, Class 10.9 phosphate or oil finished. Washer Hardened. 3mm min. thickness
Trailer	M20x2.5xClass 10.9 phosphate or oil finished. Washer Hardened. 3mm min. thickness

Table 1.1

## Torque Patterns

Vertical Mount	
Left-hand side Torque Pattern	<p>Below View of Carrier</p>
Right-hand side Torque Pattern	<p>Below View of Carrier</p>
Axial Mount	

Table 1.2

## Torque Specs

Caliper Style	Torque
Vertical Mount	200-220 ft-lbs.
Axial Mount	350-400 ft-lbs.
Trailer	350-400 ft-lbs.

Table 1.3

## Installing brake chamber

1. If not already greased, apply grease in the ball cup inside the lever of the disc brake.
2. Check that the internal boot of the chamber is properly installed on the push rod. If no boot is present, stop and contact the manufacturer before proceeding or replace the chamber.
3. Make sure the external chamber flange seal is intact and seats correctly (see figure 1.4.)
4. Check that the caliper's brake chamber mating flange and the inner boot inside the chamber are correctly seated.
5. Install the brake chamber using new self-locking nuts. Torque nuts to 118 -148 Ft. lbs. (180 ± 20Nm). Follow the vehicle/axle manufacturers recommendations.
6. Connect the brake chamber air hose connections of the service brake and if applicable the parking brake. If equipped, remove the ventilation drain plug that faces downwards from the brake chamber housing to allow proper drainage.



## Pad installation

1. Install the pad retaining springs onto the top of the brake pads.
2. Insert the brake pads into the caliper with the friction material facing the brake rotor.
3. Using a 10mm wrench, turn the adjuster (shear nut tool) clockwise until both pads touch the rotor. Then turn the adjuster 3 clicks counterclockwise to obtain a basic clearance between pads and rotor.
4. Lightly grease adjuster cap and install the rubber cap back over the adjuster nut area.
5. Push pad retainer bar into the groove of the caliper. Press down on the pad retainer bar and insert the pad retainer pin. Install washer and spring clip to pin.
6. Check that brake rotor can turn freely.
7. Apply and release the brakes 6 – 8 times. Rotor should turn easily by hand after applying and releasing the brakes.
8. Re-install the wheel(s).
9. Apply parking brakes and remove wheel chocks.
10. Road test the vehicle.

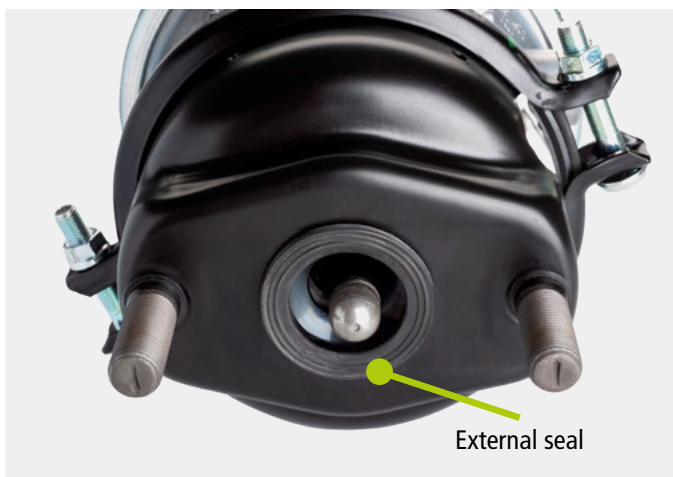


Figure 1.4



Founded in Landskrona, Sweden over a century ago, Haldex is a leading global brand with 2,200 employees serving Europe, North America and Asia the very best in tough, dependable vehicle braking and suspension solutions.

Vehicle manufacturers, aftermarket distributors, commercial truck, trailer and transit fleets, and heavy equipment and vehicle operators worldwide know our commitment to innovation, performance, safety and service.

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