

## Brake Caliper Potential Problem

### Description:

By analyzing parts from warranty claims we became aware of a potential problem which may affect different types of our pneumatic disc brake. This problem can lead to the following symptoms:

- Knocking or creaking noises when applying or releasing the brake. These noises may be audible only when the vehicle is stationary or if the actual brake pressure exceeds a certain value (typically 3.5-5 bar).
- Uneven wear of the two brake pads of the same disc brake. This can either be shown as
  - a) progressive wear of the outer pad while the inner pad wears less (difference > 3mm) or
  - b) by significant oblique wear at outer and inner brake pad material along the direction of rotation (difference between both ends of the same pad: > 2 mm).



Fig. 1: showing excessive wear of outer brake pad



Fig. 2: showing excessive wear of outer brake pad

To date, only very little or no effect on the braking or the driving operation have been determined and there are no safety implications in relation to the described effects.

However, we recognize that the described phenomenon requires a thorough and detailed investigation to uncover the actual cause and eliminate any future occurrences. However, the resulting tests have found no deviations or obvious defects, although when comparing the guide pins/bushes of affected brakes it was found that these tended to have a slightly higher surface roughness than those of unaffected brakes. Even so the apparent relationship of higher roughness having a negative effect on the function of the caliper guide system has not yet been completely proved.

As a precaution we have limited the tolerance for the maximum permissible surface roughness in order to increase the robustness of the guide system, especially when operated in very demanding applications.

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To reduce complexity for our production, we have implemented this surface tolerance adjustment for all brake types and their matching parts. This means that all brakes and all repair kits that were produced or packaged after **January 16, 2017** contain the guide pins with improved surface finish tolerance. All part numbers for brakes and spare parts remain unchanged.

## Diagnosis/Differentiation:

In the event that one or both of the symptoms described previously are observed on a vehicle, the following tests should be carried out:

1. Carry out a complete functional and visual inspection of brake pads, brake disc and caliper guidance system. Description for execution and evaluation criteria can be found in the respective service instructions (For SN7/ SM7 / SL7 / SN6 see document No. Y006471, and for SB7 Radial see document No. C16352). It is essential that all basic technical instructions and safety precautions are followed as described in the service manual.
2. In the event that the caliper guide system is impaired or restricted, remove the cap from the fixed bearing side (long bearing). Then, by moving the brake caliper along the guides the inner surface of the bearing bushings can be examined.

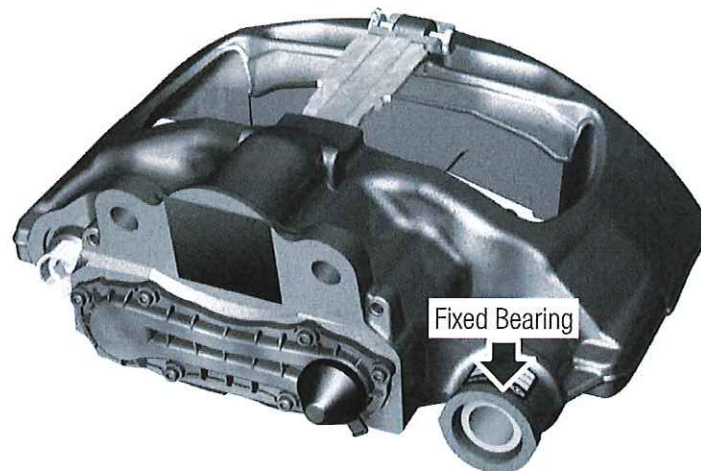


Fig. 3: Typical Axial Disc Brake - Fixed Bearing with Cap removed

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Fig. 4: Material contamination



Fig. 5: Wear/Abrasion



Fig. 6: Discolouration / Smoothing



Fig. 7: Fretting

3. If signs of wear, seizure, material transfer or discoloration are present, the caliper guides must be replaced. To do this please follow the instructions in the service manual.

Knorr-Bremse Service manual: SN7 / SM7 / SL7 / SN6: Y006471 (chapter 9) ; SB7 Radial: C16352; Chapter 8-11.

**Please note: guide pins and bearing bushes must always be replaced together!**

**Area of application / potentially affected brakes:**

The brakes possibly affected are 22.5" disc brakes of the series SN7XXX and Radial SB7XXX, manufactured between 01.01.2015 and 16.01.2017.

The production date of the disc brakes can be determined from the serial number. The first 6 digits of the serial number can be decrypted as follows:

- Digit 1: A, L, or C for the manufacturer
- Digit 2 + 3: Year of manufacture e.g. 15 = 2015
- Digit 4 + 5: Production week, e.g. 36 = 36th week in the year of manufacture
- Digit 6: Day in the production week - 1 = Monday, 2 = Tuesday, etc.

Parts manufactured during this period have a manufacturer code beginning with an A or L followed by 15xxx xxx and ending with an A or L followed by 170301 0001; i.e. the period from 01.01.2015 to 16.01.2017.

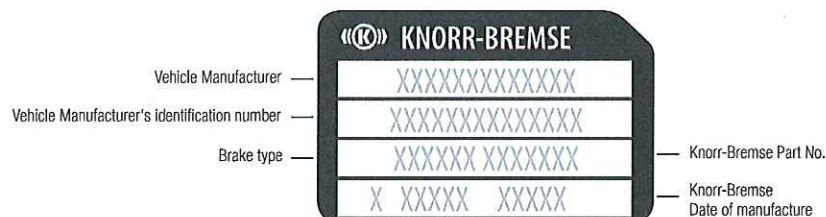


Fig. 6: Knorr-Bremse Identification Label

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## Service Instructions

Doc. No. Y279696 (EN - Rev. 000)  
June 2017

If any of the symptoms described above occur and tests conclude with the results as described in section 3, the caliper must be repaired using the correct Knorr-Bremse Guide and Seal Kit.  
Compensation will be granted in accordance with the Knorr-Bremse warranty provisions.

In order to ensure fast and timely processing of warranty claims, we ask you to document the results of your investigation according to the enclosed form (handwritten or electronic). Meaningful quality photographs of the damaged parts will facilitate the examination of potential claims.

We ask you to label all replaced components with a reference to the vehicle and the warranty application and store them for a min. of 6 weeks after warranty decision. The parts can then be scrapped.

Dispose of all packaging and waste in a responsible manner - see also Y075876  
Safety and Environmental Guidelines [www.knorr-bremseCVS.com](http://www.knorr-bremseCVS.com)

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# KNORR / BENDIX inspection checklist for disc brakes noise complaints

Inspektions Checkliste bei Geräuschproblemen an der Scheiben-Bremse

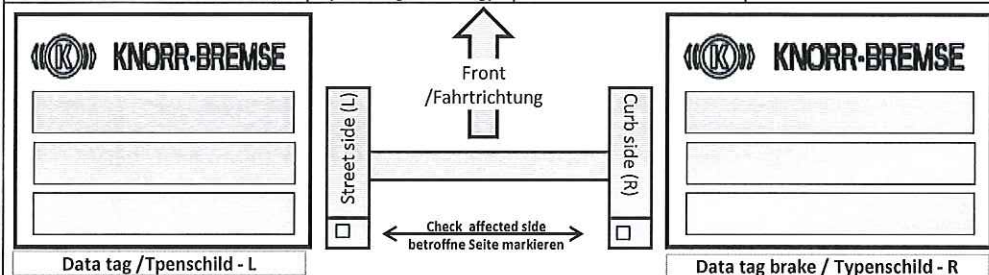
Requirements for warranty acceptance - complete checklist per each affected caliper per axle

Take digital photos of marked left (L) and right (R) calipers according to list below

Erforderlich für die Anerkennung von Gewährleistungsansprüchen - vollst. Ausgefüllte Checkliste je Bremsattel

Bitte fügen Sie digitale Fotos der mit "L" bzw. "R" markierten Sättel ein.

Technician/Techniker:		Failure date / Ausfalldatum:		Date / Datum:	
Customer / Kunde:		Complaint / Reklamation:			
Vehicle manufacturer / Fahrzeughersteller:		Vehicle type / Fahrzeugtyp:		Vehicle number / Fahrzeugnummer:	
In service date / Erstzulassung:		Chassis no. (VIN) / Fahrgestellnummer:		Mileage / Laufleistung:	
Axle manufacturer / Achsenhersteller:		Axle part number / Achsen Teile Nummer:			
Axle model / Achsentyp - Baureihe:		Axle serial number / Seriennummer Achse:			
Brake chamber manufacturer / Hersteller Bremszylinder:	<input type="checkbox"/> Knorr-Bremse	<input type="checkbox"/> Bendix	<input type="checkbox"/> MGM	<input type="checkbox"/> MGM e-stroke	<input type="checkbox"/> Arfesan
Brake manufacturer / Hersteller Bremse:	<input type="checkbox"/> Knorr-Bremse	<input type="checkbox"/> Bendix			
Axle position in the vehicle / Pos. Der Achse im Fahrzeug:	<input type="checkbox"/> Front / Vorne (steering/Lenkung)	<input type="checkbox"/> Center / Mitte	<input type="checkbox"/> Rear / Hinten (drive/Antrieb)		



Brake type / Bauform:

Axial       Radial

	Caliper / Sattel - L		Caliper / Sattel - R		Comments / Kommentar
	Yes / Ja	No / Nein	Yes / Ja	No / Nein	
1. Is the noise reproduceable applying the service brake > 6 bar (> 90 psi) / Sind ab einem Bremsdruck > 6 bar Geräusche hörbar?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Caliper movement within running clearance (retainer bar and brake pads installed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. If caliper movement within running clearance is <u>not possible</u> detailed inspection according to general checklist is necessary					
4. Picture documentation performed? - data plate of brake caliper and axle? - caliper installed on axle? - both pads after removal? - dismantled fixed bearing pin(s) in cleaned condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Thickness of brake pads (New condition: 30mm including 9 mm back plate)	Inboard:	mm	Inboard:	mm	
	Outboard:	mm	Outboard:	mm	
6a) Case 1: caliper not exchanged, only rebushed (same caliper on axle) Caliper floating system rebushed and caliper movement along guide pins positive checked while mounted on the axle? (slide caliper fully IN and OUT - brake pads removed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6b) Case 2: caliper exchanged to an already rebushed one Caliper floating system rebushed and caliper movement along guide pins positive checked while mounted on the axle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	new left caliper on axle:  new right caliper on axle:
PLEASE note serial number (e.g. A/L16152 06423) of exchange caliper in comments field					
7. Data plate of rebushed or exchanged caliper marked with two punch marks (refer to the pictures)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	