

REFERENCE:	Nova Bus Manuals
SECTION:	05: Axle, central and rear
RS N°:	MQR 7621-1248
EFFECTIVE IN PROD.:	LA34-001 (2017MR)
TC RECALL N°:	TC 2018-257
NHTSA RECALL N°:	NHTSA 18V299

APPLICATION DEADLINE: NA
CLAIM REFERENCE NUMBER: SR-4361

SUBJECT:	Brake caliper recall campaign
JUSTIFICATION:	Increased friction on caliper guide pins due to surface roughness

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Replace brakes calipers	Nova Bus	Nova Bus	3h20min
2	-	-	-	-

**MATERIAL**

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
<b>LEVEL 1</b>				
1	N8908325	-	Right full load caliper	-
1	N8908326	-	Left full load caliper	-
4	N8908945	-	Actuator nut	-
<b>LEVEL 2</b>				
-	-	-	-	-

Materials will be available within 70 days once your order has been placed. To order, please contact Prevest Parts by phone at 1-800-771-6682, by fax at 1-888-668-2555 or by email at [prevostparts.commandes@volvo.com](mailto:prevostparts.commandes@volvo.com). Specify document number, quantity of parts required and shipping address.

**DISPOSAL OF PARTS**

REMOVED PARTS ARE:	DISCARDED	RETAINED *	* To be reimbursed, the parts must be retained and returned in accordance with the usual warranty procedure.
	-	Yes	

**REVISION HISTORY**

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2018-07-20	Initial release	Marc Rougeau
R1	2018AU23	Added instructions to steps 1.7, 1.13, 1.15 and 1.19. Added p/n N8908945	Marc Rougeau

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
BC Transit - BCT - British Columbia	L891	—	—	L82J5F3001565	L82J2F3001569	5
Bow Valley Transit - Alberta	L993	—	—	L82JXG3750329	L82J6G3750330	2
Bow Valley Transit - Alberta	LA26	—	—	L82J4H3750473	L82J4H3750473	1
Brandon - Manitoba	L899	67	70	L82J2G3750180	L82J8G3750183	4
Brantford - Ontario	L928	10151	10153	L82J7F3001793	L82J0F3001795	3
Brantford - Ontario	LA03	10161	10612	L82J0G3750369	L82J7G3750370	2
Cape Breton Nova Scotia	LA12	7092	7093	L82J8H3750587	L82JXH3750588	2
Cornwall Ontario - Metrolinx	L935	—	—	L82J3F3001838	L82J5F3001839	2
Fredericton - New Brunswick	L901	8151	8151	L82J7F3001602	L82J7F3001602	1
Fredericton - New Brunswick	L968	8161	8162	L82J1G3750218	L82J3G3750219	2
Milton - Ontario - Metrolinx	L884	1701	1702	L82J0G3750338	L82J2G3750339	2
Niagara Falls - Ontario	L987	1601	1604	L82J6G3750344	L82J1G3750347	4
North Bay - Ontario	L895	784	785	L82J7F3001678	L82J9F3001679	2
North Bay - Ontario	L979	786	787	L82J4G3750312	L82J6G3750313	2
Orillia Ontario - Metrolinx	L965	1722	1724	L82J3G3750320	L82J7G3750322	3
Sarnia Ontario	L873	151	152	L82J0F3001599	L82J0F3001600	2
Sarnia Ontario	L883	153	153	L82J4G3750021	L82J4G3750021	1
Sarnia Ontario	L963	162	162	L82J7G3750305	L82J7G3750305	1
Sault Ste. Marie Ontario	L934	—	—	L82JXG3750038	L82JXG3750038	1
St. John - New Brunswick	L871	40585	40586	L82J8F3001592	L82JXF3001593	2
St. John - New Brunswick	L939	40687	40687	L82J0G3750078	L82J0G3750078	1
Stratford - Ontario	L893	—	—	L82J9F3001584	L82J0F3001585	2
Timmins - Ontario	L995	—	—	L82JXG3750377	L82JXG3750377	1
Toronto Transit Commission - TTC - Ontario	L998	8625	8626	L82J7H3750550	L82J9H3750551	2
Welland Ontario - Metrolinx	L866	—	—	L82J9F3001648	L82J9F3001648	1
Welland Ontario - Metrolinx	L933	—	—	L82J1G3750011	L82J1G3750011	1
Welland Ontario - Metrolinx	L991	—	—	L82J9G3750287	L82J9G3750287	1
Whitehorse - Yukon	LA04	—	—	L82J2G3750390	L82J4G3750391	2
Woodstock - Ontario	L923	15-16	15-16	L82J9F3001746	L82J9F3001746	1

**WARNING**

Follow your internal safety procedures.

**PROCEDURE**

- 1.1. Park the vehicle on level ground and place the transmission in neutral (N).
- 1.2. Place the master control switch and the battery disconnect switch in the off position. Follow your local lock-out procedure (see Figure 1).

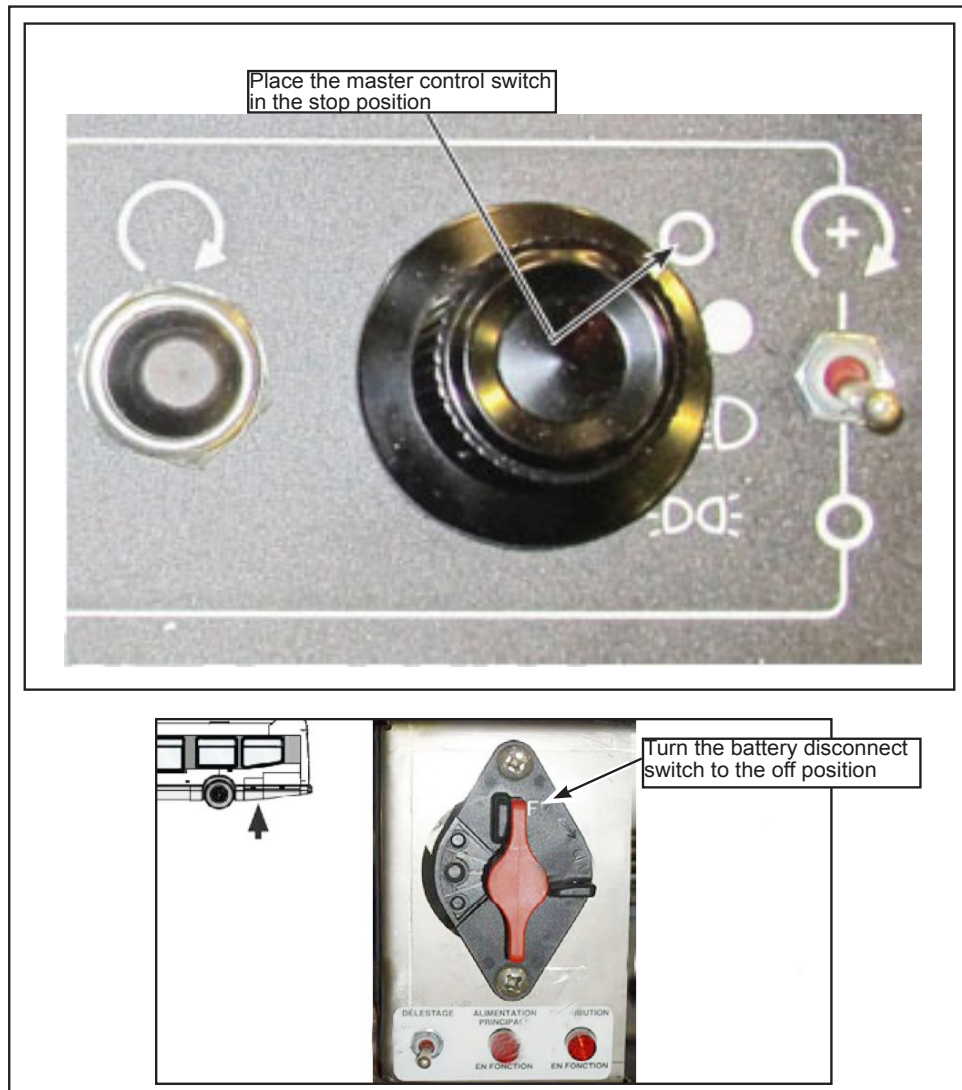


Figure 1 - Place the Master Control Switch and the Battery Disconnect Switch in the Stop Position

**NOTE**

The following procedure is provided by ZF Group and Knorr-Bremse. Nova Bus cannot be held responsible for its content.

1.3. Knorr brake caliper version SB7 identification (see Figure 2). Documentation of completed service must be logged on affected axle spreadsheet, see annex 1.

- ✓ Caliper identification:  
- SB7 (ScheibenBremse)
- ✓ The Knorr type plate includes brake type, Knorr-Bremse part number, axle or vehicle manufacturer's identification number and Knorr-Bremse date of manufacture
- ✓ Radial disc brake SB7 caliper are installed on rear axles (center/drive) with radial mounted service/parking brake chamber

**Identification Plate variations**

**Radial disc brake SB7**

Figure 2 - Brake Caliper Identification

1.4. Raise the vehicle according to your maintenance facilities procedures. Secure the vehicle with additional supports at the correct supporting points, see section 18 (Hoisting and Towing) of the maintenance manual (see Figure 3).

T-DRIVE CONFIGURATION

**H** - HOISTING (REFERS TO RAISING THE BUS USING EQUIPMENT SUCH AS KONI TOWER HOISTS UNDER THE WHEELS/TIRES OF THE BUS)

**J** - JACKING (REFERS TO LOCATIONS ON THE BUS WHERE A FLOOR OR BOTTLE JACK IS USED TO RAISE THE BUS)

**M** - MANDATORY SUPPORT POINT FOR SAFETY STANDS

**S** - SUPPORT POINT FOR SAFETY STANDS

**A** - ADDITIONAL SUPPORT POINTS FOR SAFETY STANDS

**WARNING**

Although it is recommended to follow internal, local, state/provincial, and federal regulations when hoisting, Nova Bus advises to use a minimum of four safety stands to support the vehicle. Two stands should be placed behind the rear axle, and two at the front axle.

Figure 3 - Hoisting Points

1.5. Verify and record (see Annex 1) the affected axle serial no. on the type plate (see Figure 4).

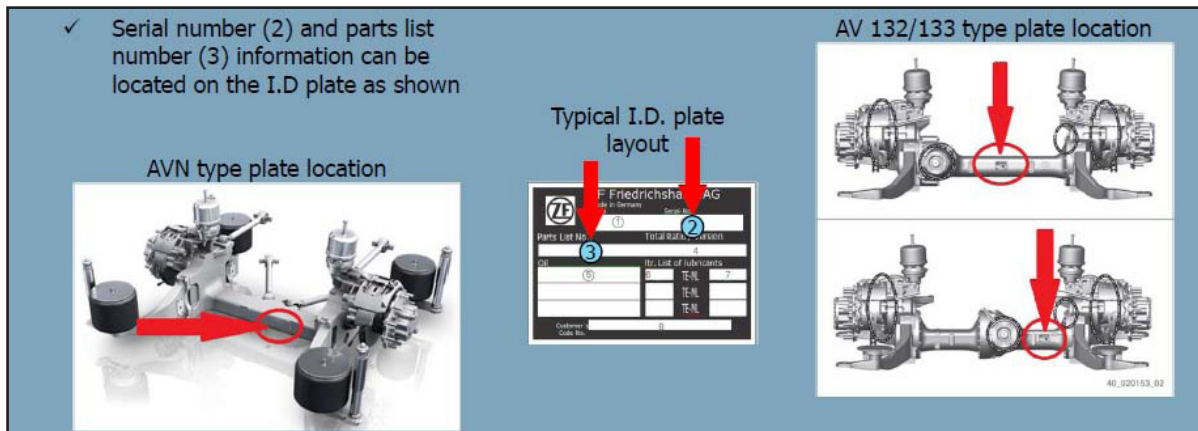


Figure 4 - Axle Serial no.

1.6. Remove the left and right wheels (see Figure 5).

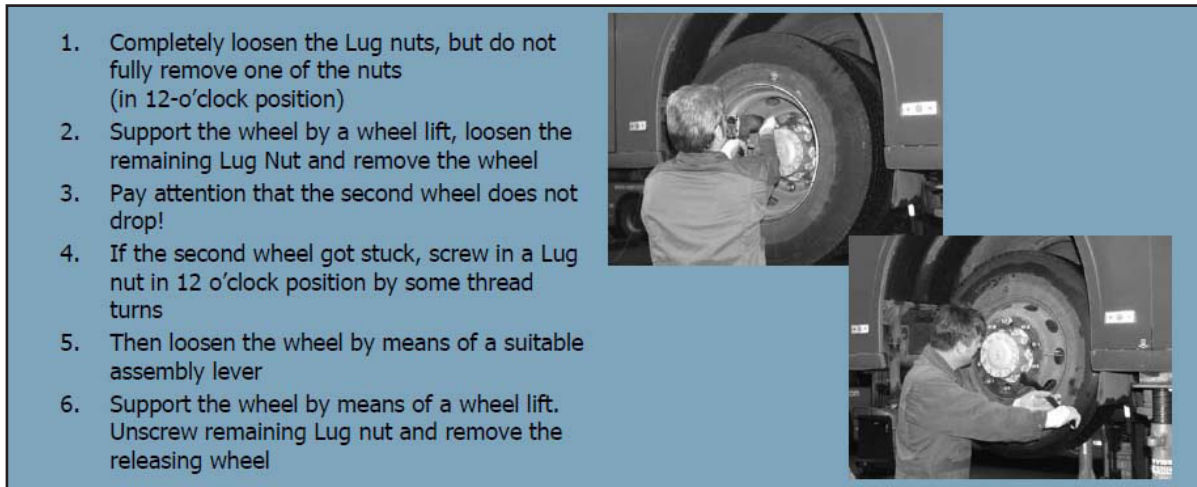


Figure 5 - Wheel Removal

1.7. Verify and record (see Annex 1) the Knorr brake caliper production no.. If the production date code is out of range or if the caliper type plate is already punched, no further action is required (see Figure 6). Indicate labor time to submit a claim.

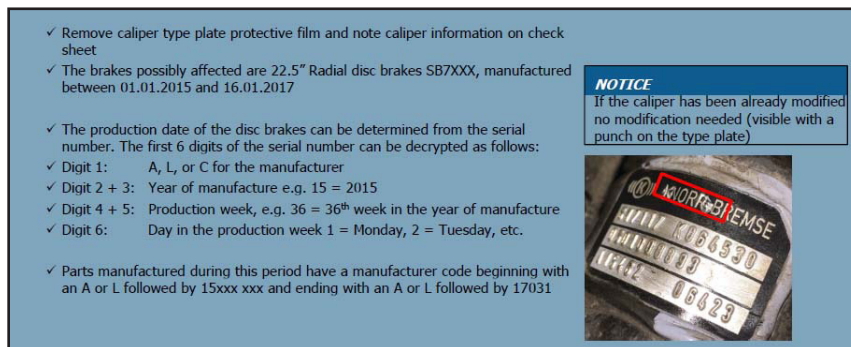
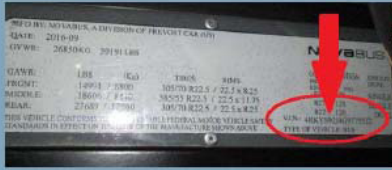


Figure 6 - Brake Caliper Production no.

1.8. Collect all relevant data (see Annex 1) (see Figure 7).

- ✓ Please collect all relevant information
- ✓ Requirement is to submit 1 claim per caliper (2 claims per axle)
- ✓ Must provide Knorr caliper type plate information including removed and replacement caliper information (where applicable)
- ✓ Please provide information listed below as well:
  1. Vehicle in service date (provided by depot)
  2. Vehicle fleet number
  3. Chassis no. (VIN number)
  4. Vehicle mileage
  5. Axle part list number
  6. Axle serial number
  7. Date of re-bushing

**Typical VIN location**



**Dash Mileage readout**




Figure 7 - Collect Relevant Data

1.9. Removal of the brake chambers left and right side (see Figure 8).

1. Cage the parking brake
 

**Caution!**

Ensure that the park brake is engaged and the spring chamber is released by compressed air

Note: Without air-released spring brake, the caging bolt would be highly stressed when backed out
2. Do not use "power tools"!
3. Clean the surrounding of the attachment areas in order to avoid ingress of dirt into the interior of the brake
4. Loosen the locknuts and remove brake chamber
5. Fix brake chamber with suitable aids (e.g. wire, rope) in the wheel house and cover the openings
6. Inspect mounting face on the brake caliper for any signs of moisture (rust) or contamination
7. Protect the mounting face on the brake caliper by an adequate protective cover or cloth

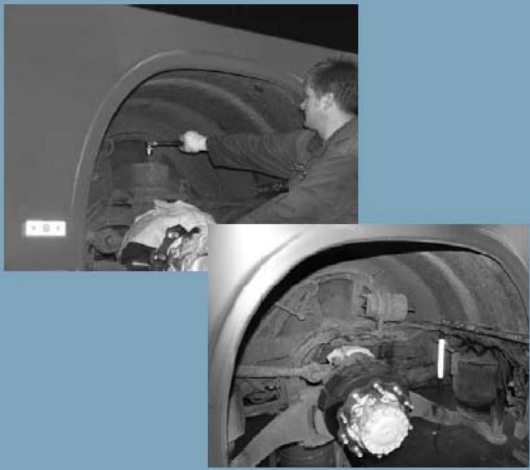



Figure 8 - Removal of Brake Chambers

1.10. Removal of electrical wear sensor connections or potentiometer connections (see Figure 9).

1. Loosen the screws at the potentiometer (wear indicator) and pull off the releasing plug
2. Inspect for any bent pins or corrosion at the plug

**Removal of potentiometer screws**



**NOTICE**

Pad wear may be monitored on certain busses through the dash. If reading is N/A in any position, potentiometer must be tested for correct function

Potentiometer location

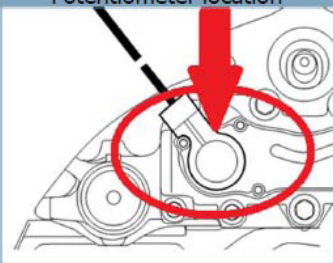


Figure 9 - Removal of Wear Sensor

1.11. Remove the brake pads (see Figure 10).

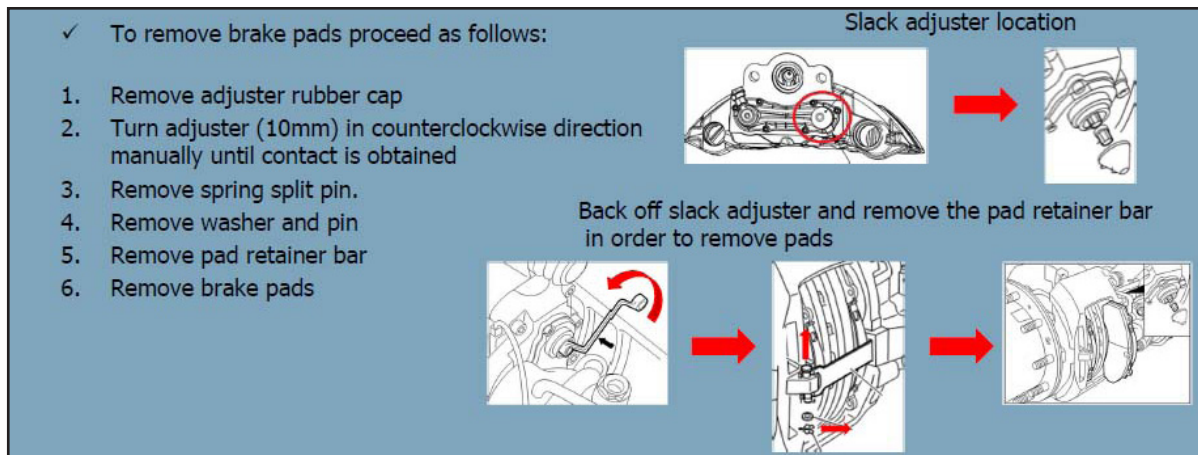


Figure 10 - Remove the Brake Pads

1.12. Remove the 6 carrier bolts at the center or drive axle (see Figure 11).

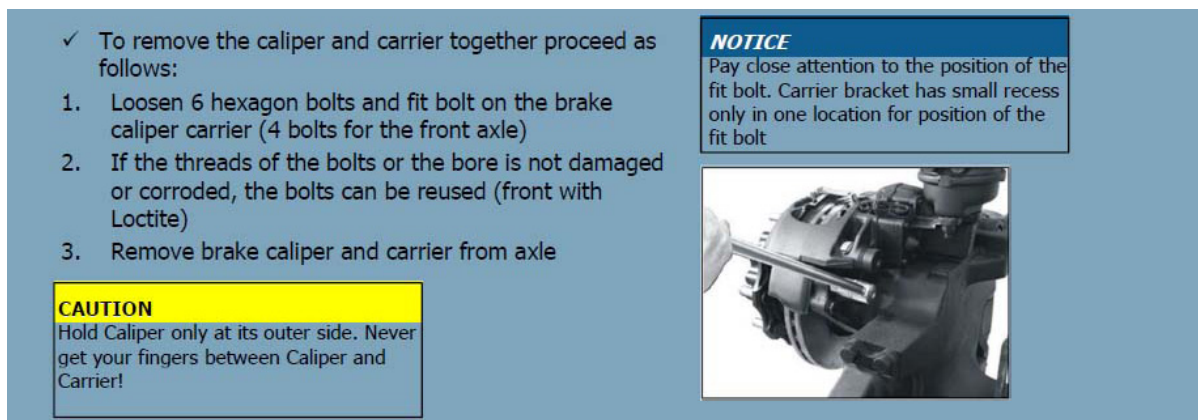


Figure 11 - Remove the 6 Carrier Bolts

1.13. Install the new Knorr brake caliper (see Figure 12).

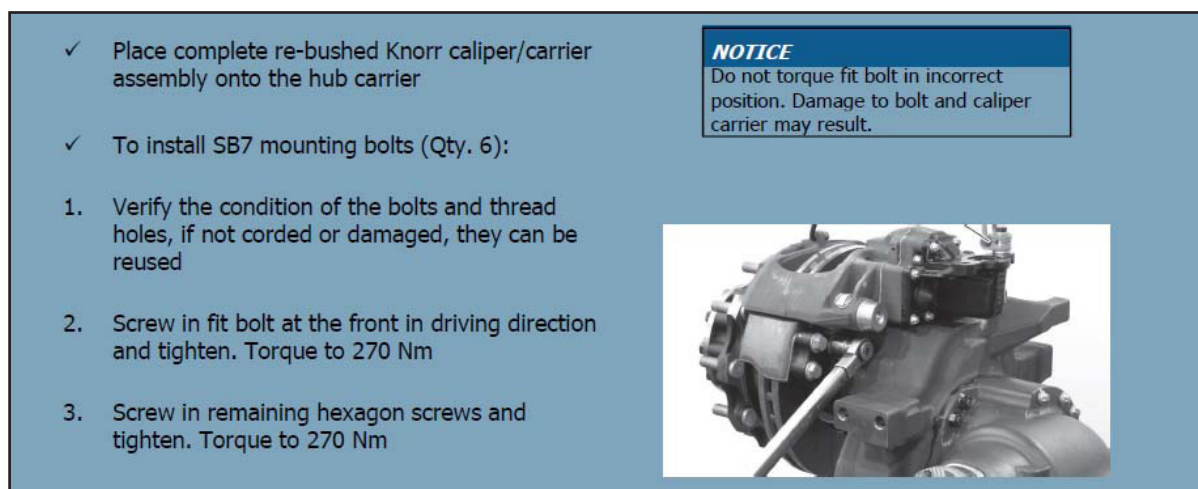


Figure 12 - Install the New Brake Caliper

1.14. Refit the brake chamber, use the new actuator nuts (N8908945) provided (see Figure 13).

- ✓ To install brake chamber proceed as follows:
  1. Ensure that the spring brake is still released by compressed air
  2. Mount brake chamber with the connections in direction as removed
  3. Fix brake chamber on brake caliper by means of new locknuts
  4. Tightening torque (M16x1.5) MA =  $195 \pm 15$  Nm
  5. Release the caging bolt to the brake release position with the tightening torque specified by the manufacturer

**Note:**  
Different manufacturers may call for different torques and the actuator is not always included in ZF's delivery scope

  6. Install the potentiometer (wear indicator) electrical connector and tighten the two screws

Install new locknuts and torque


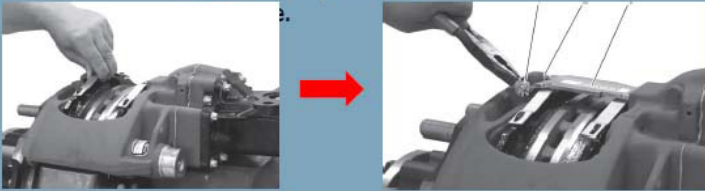


Figure 13 - Install the Brake Chamber

1.15. Install brake pads, installing new brake pads is an option (see Figure 14).

- ✓ To refit brake pads proceed as follows:
  1. Install brake pads
  2. Install pad retainer bar
  3. Install washer and pin
  4. Install the shear adapter
  5. Turn adjuster (10mm) in clockwise direction manually until contact is obtained. Then back off three clicks to set pad clearance
  6. Install protective cap and shear nut

Install brake pads and



Adjust pad clearance (back 3 clicks) and install new cap.

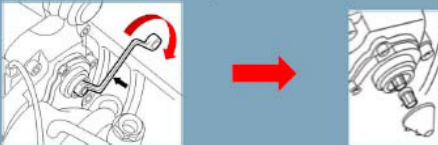


Figure 14 - Install Brake Pads

1.16. Install the wheels (see Figure 15).

- ✓ To reinstall wheels proceed as follows:
  1. Use a suitable wheel lift to mount both wheels one after another, afterwards bolt wheel nuts on wheel studs
  2. Make sure that contact faces are clean and valves of the wheels are in opposite position. Tighten wheel nuts crosswise
  3. For tightening torque refer to manufacturers specification
  4. Retighten wheel nuts after 30 miles of travel!




Figure 15 - Install the Wheels

## 1.17. Deceleration test (see Figure 17).

✓ Perform deceleration test of service brake and parking brake after completion of caliper replacement/re-bushing and ensure that the decelerations meet the pass criteria's

Brake Meter test printout




Figure 16 - Deceleration Test

## 1.18. Send relevant data to ZF via the OEM (see Figure 18). ❖

✓ **Be sure to send all relevant data to ZF via the OEM**  
For further assistance contact ZF CV technical service group at:

✓ **Address**  
ZF Services North America, LLC  
777 Hickory Hill Drive  
Vernon Hills, IL 60061

✓ **Phone**  
(800) 451-2595

✓ **Email**  
VHL-CV-TechSupport-NA@zf.com

Figure 17 - Send Relavent Data to ZF

**ANNEX 1**

<b>Road Number:</b>		
<b>Fleet/Location/Depot:</b>		
<b>VIN:</b>		
<b>Vehicle type:</b>		
<b>Order:</b>		
<b>Vehicle mileage</b>	<b>In miles</b>	
	<b>In KM</b>	
<b>In Service date</b>		
<b>Repair date (same date per vehicle or add new line )</b>		
<b>Drive axle brake caliper (SN)</b>	<b>Drive axle AVN132</b>	serial no.
		Part no.
	Removed (Knorr-Bremse serial no.)	Left
		Right
	Installed (Knorr-Bremse serial no.)	Left
		Right
	<b>Kind of work done (specify which side)</b>	TRR
		CRR
		CRB
	<b>First add the kind of work. For TRR (Tire Removal Reinstallation), CRR (Caliper Removal and Reinstallation) add your respective work time into row "Labor for R&amp;R", for CRB (Caliper Rebushing) add your work time into row "Labor for rebushing"</b>	Reference no.
		Claimant
		<b>Labor for R&amp;R (removal and reinstallation)</b> (in hours)
<b>Labor for rebushing</b> (in hours)		
Comments regarding the work done and if travel costs or miscellaneous cost are required please comment / *receipts needed		