

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-4359

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°
LEVEL 1				
1	N8908325	-	Right full load caliper	-
1	N8908326	-	Left full load caliper	-
4	N8908945	-	Actuator nut	-
LEVEL 2				
-	-	-	-	-

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. 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	2018AU22	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	
Démo-2017	L980	—	—	L82J1G97 [REDACTED]	L82J9G9 [REDACTED]	3
Duke University - North Carolina	L938	—	—	L82L8G9 [REDACTED]	L82L0G97 [REDACTED]	2

**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).

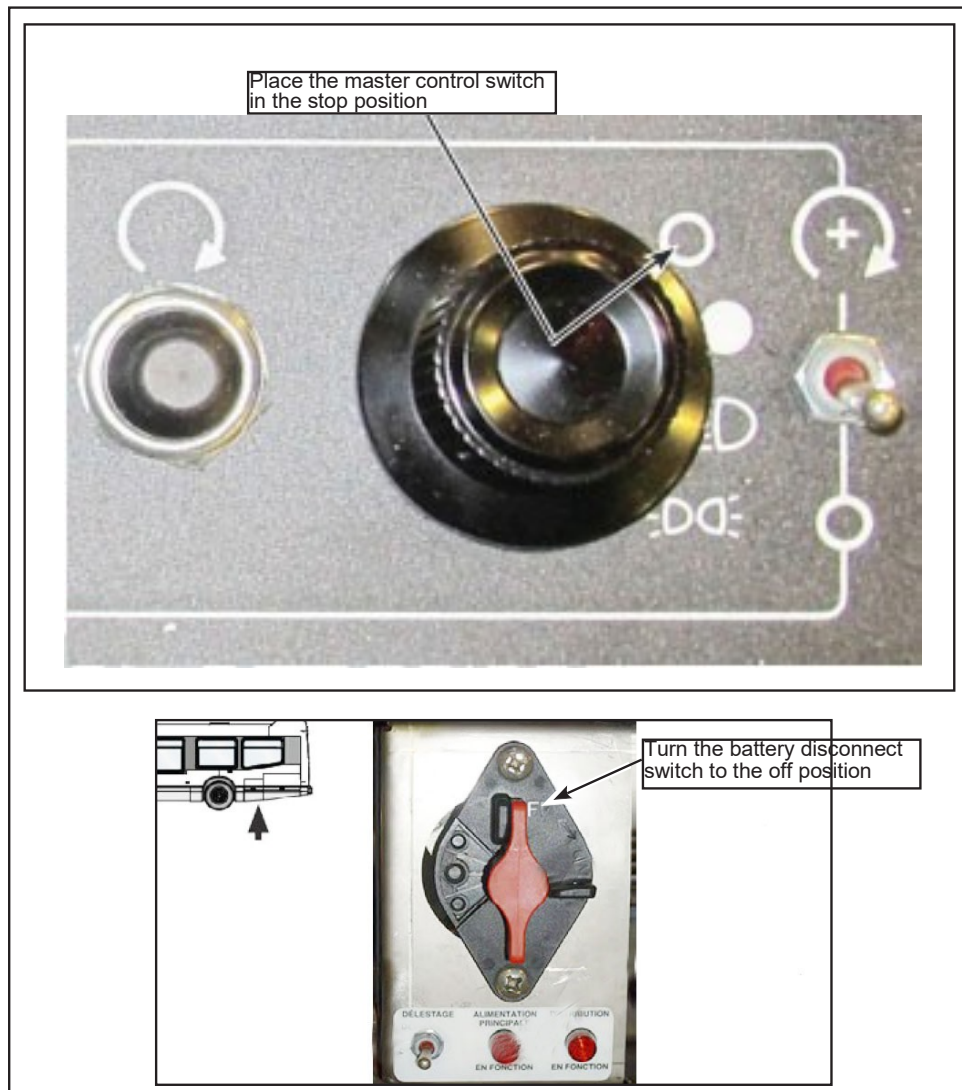


Figure 1 - Place the Master Control Switch and the Battery Disconnect Switch in the Stop Position

**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

Figure 3 - Hoisting Points

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

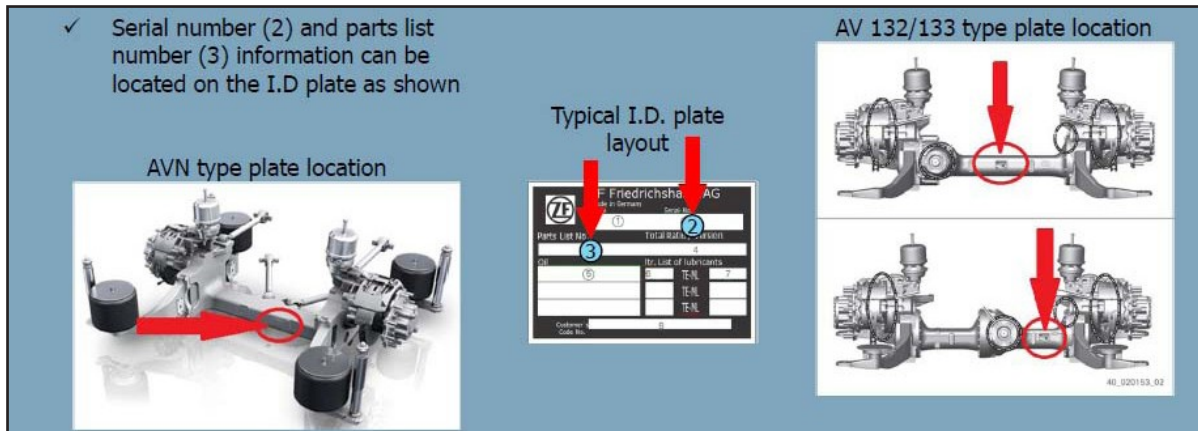


Figure 4 - Axle Serial no.

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

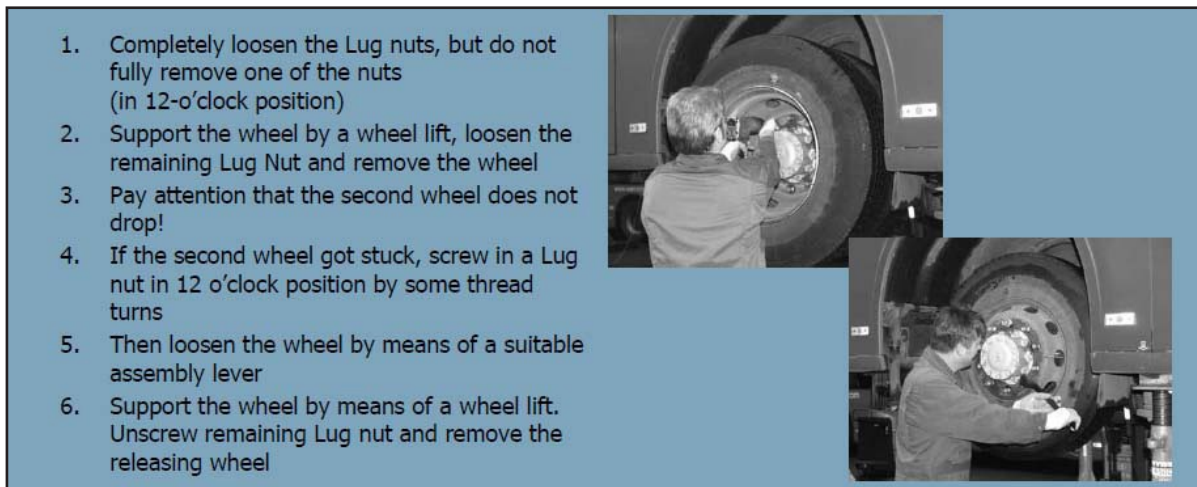


Figure 5 - Wheel Removal

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.

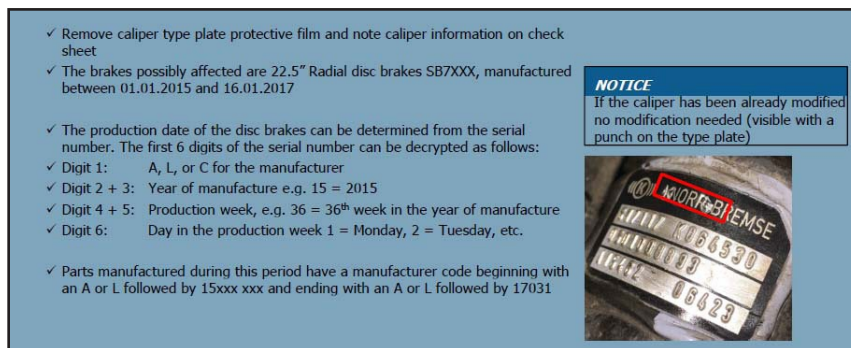



Figure 6 - Brake Caliper Production no.

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

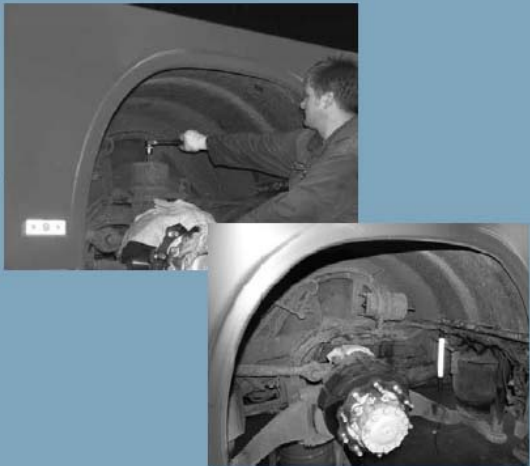


Figure 8 - Removal of Brake Chambers


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

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

Removal of potentiometer screws



Potentiometer location

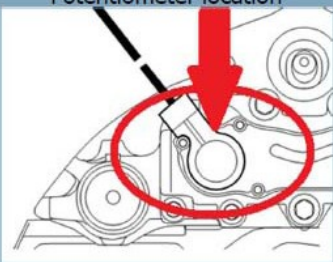


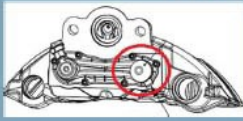

Figure 9 - Removal of Wear Sensor

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

✓ To remove brake pads proceed as follows:

1. Remove adjuster rubber cap
2. Turn adjuster (10mm) in counterclockwise direction manually until contact is obtained
3. Remove spring split pin.
4. Remove washer and pin
5. Remove pad retainer bar
6. Remove brake pads

Slack adjuster location

Back off slack adjuster and remove the pad retainer bar in order to remove pads


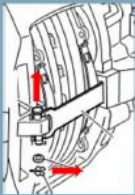
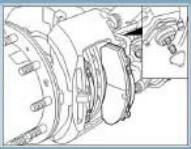





Figure 10 - Remove the Brake Pads

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

✓ To remove the caliper and carrier together proceed as follows:

1. Loosen 6 hexagon bolts and fit bolt on the brake caliper carrier (4 bolts for the front axle)
2. If the threads of the bolts or the bore is not damaged or corroded, the bolts can be reused (front with Loctite)
3. Remove brake caliper and carrier from axle

NOTICE
Pay close attention to the position of the fit bolt. Carrier bracket has small recess only in one location for position of the fit bolt



CAUTION
Hold Caliper only at its outer side. Never get your fingers between Caliper and Carrier!

Figure 11 - Remove the 6 Carrier Bolts

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

✓ Place complete re-bushed Knorr caliper/carrier assembly onto the hub carrier

✓ To install SB7 mounting bolts (Qty. 6):

1. Verify the condition of the bolts and thread holes, if not corded or damaged, they can be reused
2. Screw in fit bolt at the front in driving direction and tighten. Torque to 270 Nm
3. Screw in remaining hexagon screws and tighten. Torque to 270 Nm

NOTICE
Do not torque fit bolt in incorrect position. Damage to bolt and caliper carrier may result.




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 ± 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




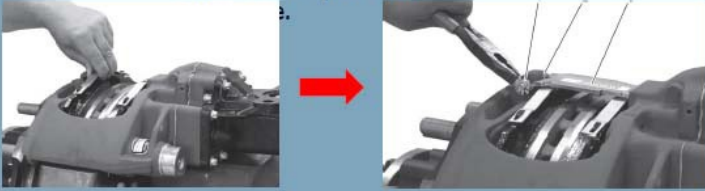
Figure 13 - Install the Brake Chamber

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.

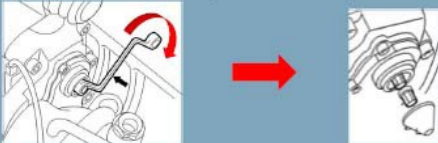


Figure 14 - Install the Brake Pads

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 16).

✓ 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



Signature: *serie*

Figure 16 - Deceleration Test

1.18. Send relevant data to ZF via the OEM (see Figure 17).❖

✓ **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 Relevant Data to ZF

ANNEX 1

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