SERVICE BULLETIN

SB1423

ADDRESSEES	:	Owners and operators of coaches
VEHICLE MODELS	:	T2100, C2045, CX35, CX45, TX40, TX45, TD925US, TDX25US
MANUAL CHAPTER	:	7.06 Steering – front axle steering
BULLETIN TYPE	:	Service information
DATE	:	November 29th, 2017
SUBJECT	:	**To check universal joints of front-axle steering system**
TERMS AND CONDITIONS	:	Refer to chapter "Warranty" further on in this bulletin.

DESCRIPTION

It has been reported to us that steering is stiff on some vehicles. The phenomenon is characterized by tight spots while steering to the left as well as to the right. Research has revealed that this phenomenon is caused by stiff movement of the universal joints in the steering mechanism. Owners and operators perceiving this phenomenon are asked to check the universal joints of the steering system according to the instructions in this service bulletin and, if necessary, to replace the universal joints.

NOTE: Also take the occasion to check whether safety recall SB1366 "To change front axle steering system bevel gear" applies to your vehicle. To this end, open the "Service Documentation" menu in the Van Hool customer portal. Then fill in the construction number of your vehicle and click on "Show Documents". Now check whether SB1366 is mentioned under the section "Service Bulletins - Safety recall". If so, carry out the instructions contained in this Service Bulletin.

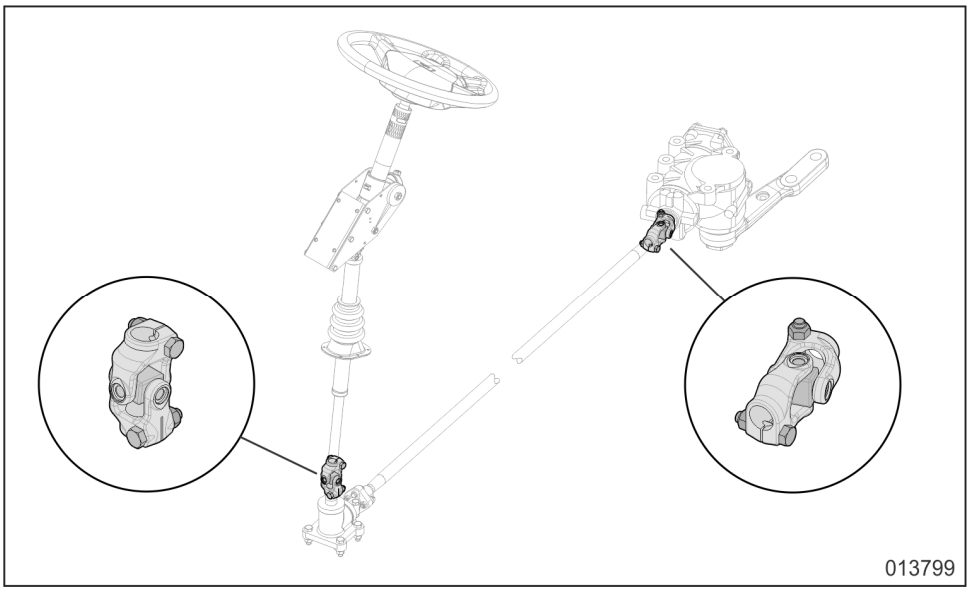


Figure 1: Steering mechanism (typical), location of universal joints

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UNIVERSAL JOINTS: TWO VERSIONS

Due to variations in the length of the front overhang and the height of the driver's cab floor, certain components in the steering system differ depending on the vehicle model. With respect to the universal joints, this comes down to the fact that two versions (short and long) are circulating. The short one is 100 mm long, the long one 120 mm. Double deckers have a short universal joint at the bevel gear as well as at the steering gear side, single deckers combine a short and a long universal joint: the short one is located at the bevel gear, the long one at the steering gear.

Before ordering, it is important to determine which universal joints are mounted on your vehicle. Only then will you be able to pick the proper transformation kit (see further on below "Transformation kits for universal joint replacement").

PREPARATIONS

- Park the vehicle over a flat inspection pit, with the front wheels in the straight-ahead position. Apply the parking brake. Stop the engine. Switch off all systems and turn off the battery isolation switch on the dashboard.
- Open the mechanical battery isolation switch.
- Put a "DO NOT START" warning message on the instrument panel before starting the checks or repairs.
- Put chocks in front of and behind the drive axle wheels.
- **Read the entire procedure before starting to work.**



WARNING!

Observe safe shop practices at all times.

PROCEDURE:

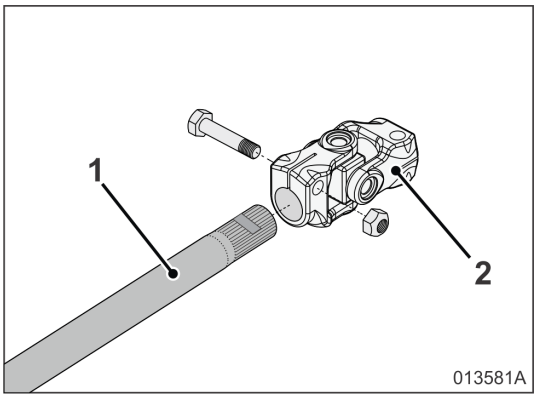
Step	Action
1	Put the steering wheel in the highest position.
2	Jack up the front axle until the wheels clear the ground.
3	Turn the steering wheel alternately to the right and to the left with short motions, as an assistant observes the behaviour of the universal joint at the bevel gear and at the steering box. Is any play noticeable? • If so, go to step 5. • If not, go to step 4.
4	Turn the steering wheel from stop to stop. Does this action go smooth and is it continuous without having to apply variable degrees of effort? • If so, no further actions are necessary with respect to this Service Bulletin. • If not, go to step 5.
5	Establish which universal joint version (long or short) is mounted on your vehicle and choose the corresponding transformation kit (see further on under "Transformation kits for universal joint replacement").
6	Remove the universal joint at the bevel gear and at the steering box as described under "STEP 6 IN DETAIL".
7	Mount the new universal joints as described under "STEP 7 IN DETAIL".

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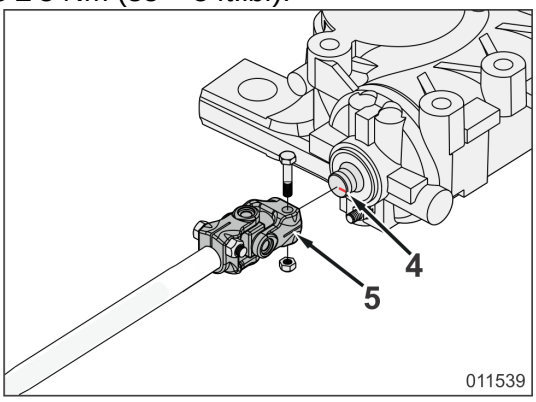
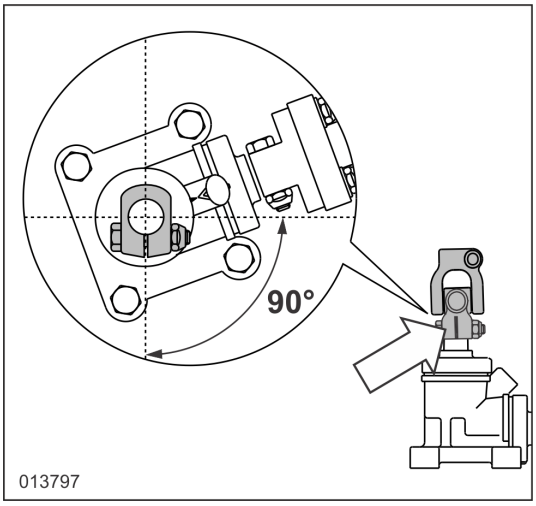
STEP 6 IN DETAIL: To remove universal joints

Step	Action
6.1	Lower the vehicle and make sure the front wheels are still in the straight-ahead position.
6.2	Lock the steering wheel in the straight ahead position.
6.3	**Only for vehicles with a mixed transformation kit (= long and short universal joint):** note the location of the long and short universal joint (in view of remounting later on).
6.4	Remove the clamp bolts of the universal joint at the bevel gear. Slide the telescopic shaft of the steering column upward and remove the universal joint.
6.5	Remove the clamp bolts of the universal joint at the steering gear.
6.6	Note the mounting position of the four clamping bolts that secure the bevel gear to the chassis (in view of remounting later on). This is necessary given that, on some vehicle types, not all the bolts have been mounted from above. Remove the four clamping bolts.
6.7	Pull the bevel gear forward, together with the intermediate shaft, until there is enough room to remove the universal joint at the steering box. Remove the universal joint.

STEP 7 IN DETAIL: To mount universal joints

Step	Action
7.1	*NOTE: Only for vehicles with mixed transformation kit: take the location of the universal joints into account (refer to note from step 6.3).* **At the steering gear:** slide universal joint (2) from the kit on intermediate shaft (1), so that the recess in the serrations of the shaft end leaves the passage for the universal joint clamping bolt clear. Mount the clamping bolt supplied with the universal joint, together with the self-locking nut. Do not tighten the nut yet (tightening will be done further on!).  **Figure 2**

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7.2	**At the steering gear:** secure the intermediate shaft with the universal joint to the steering gear input shaft. Make sure that clamp slot (5) of the joint coincides with mark (4) stamped on the steering-box input shaft. Mount the clamping bolt supplied with the universal joint, together with a self-locking nut. Tighten the nut of the fixing bolt to a torque of 48 ± 5 Nm (35 + 5 ft.lbf).  **Figure 3**
7.3	Using the four M12 bolts from the kit, secure the bevel gear to the chassis. Pay attention to the mounting position when mounting the bolts (see figure in step 6.6). If on your vehicle any shims were present under the bevel gear, re-install them. Tighten the nuts to a torque of 70 ± 10 Nm (52 ± 7 ft.lbf).
7.4	Tighten the clamping bolt of the universal joint mounted in step 7.1 to a torque of 48 + 5 Nm (35 + 5 ft.lbf).
7.5	Secure the other universal joint of the kit at the bevel gear. To this end, use the clamping bolt supplied with the universal joint, together with a self-locking nut. Make sure that the clamping slot of the universal joint is perpendicular to the longitudinal vehicle axis (refer to figure 4). Tighten the nut of the clamping bolt to a torque of 48 + 5 Nm (35 + 5 ft.lbf).  **Figure 4**
7.6	Slide the telescopic shaft of the steering column into the new universal joint. Mount the clamping bolt supplied with the universal joint, together with a self-locking nut. Tighten the nut of the clamping bolt to a torque of 48 + 5 Nm (35 + 5 ft.lbf).
7.7	Unlock the steering wheel.
7.8	Take a test drive and check the installation again.

End of procedure.

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TRANSFORMATION KITS FOR UNIVERSAL JOINT REPLACEMENT

VH reference	Description
11560659	Transformation kit consisting of a short and a long universal joint (to be used on single deckers)
11562157	Transformation kit consisting of two short universal joints (to be used on double deckers)

Components of transformation set VH11560659

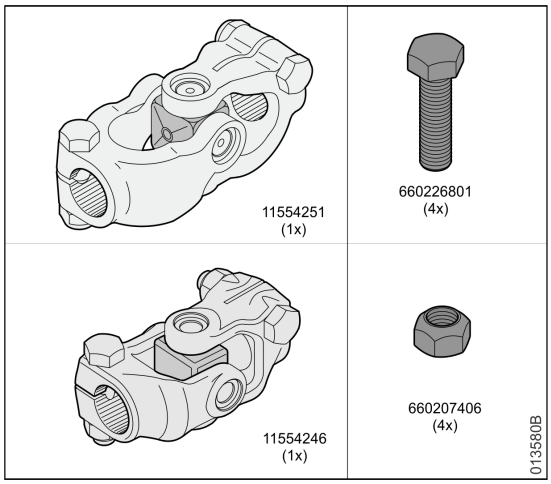


Figure 5

VH reference	Description	Quantity
11554251	Long universal joint with fastening material	1
11554246	Short universal joint with fastening material	1
660226801	Fixing screw of bevel gear (M12x1,75, length 45 mm)	4
660207406	Self-locking nut (M12x1,75)	4

Components of transformation set VH11562157

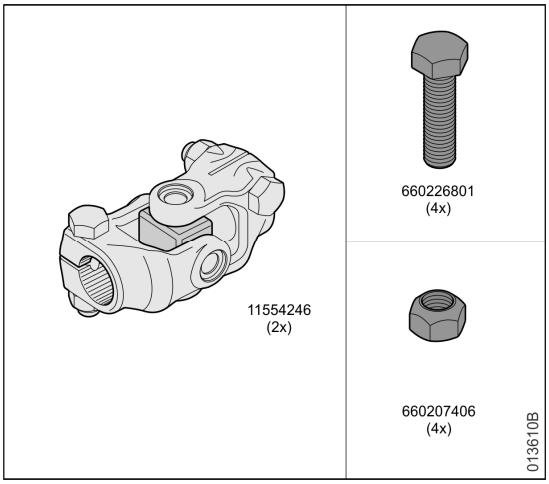


Figure 7

VH reference	Description	Quantity
11554246	Short universal joint with fastening material	2
660226801	Fixing screw of bevel gear (M12x1,75, length 45 mm)	4
660207406	Self-locking nut (M12x1,75)	4

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Old and new parts are interchangeable, but only the new ones are supplied as spare part.

- Parts can be purchased through the usual channels.
- Waste disposal: dispose of removed components and used products in accordance with the local environmental regulations.

WARRANTY

This Service Bulletin is covered by Van Hool's standard warranty.

HELP DESK:

If there are any questions, please call ABC Customer Care & Parts Source toll-free for guidance on 1-877-427-7278. Listen for the prompts for warranty and select that option.

DISCLAIMER:

The procedures contained herein are not exclusive. Van Hool cannot possibly know, evaluate, or advise the transportation industry of all conceivable ways in which a procedure may be undertaken or of the possible consequences of each such procedure. Other procedures may be as good, or better, depending upon the particular circumstances involved. Each carrier who uses the procedures herein must first satisfy itself thoroughly that neither the safety of its employees or agents, nor the safety or usefulness of any products, will be jeopardized by any procedure selected.

INFORMATION HANDLING:

Important additions and modifications regarding technical information not yet included in the manual will be communicated through Service Bulletins.

VAN HOOL CUSTOMER PORTAL:

Consult the customer portal regularly for the latest service documentation. In addition to the maintenance manual, you will also find the operating manual and the spare parts catalogue of your vehicle on the customer portal. The customer portal is accessible through www.vanhool.be under the "service" menu item, and only with a code (password) from Van Hool. If you do not have a password yet, request it by using the link on the Van Hool website.