



# SERVICE BULLETIN

SB1288

<b>ADDRESSEES</b>	: ABC Customer Care and Parts Source Owners and operators of coaches listed under 'Application'
<b>VEHICLE TYPE</b>	: T2100, C2045, CX, TX, TD925US, TDX25US, A300K, A300L, A330, AG300
<b>CONFIGURATION GROUP</b>	: 7.06 Steering – front-axle steering
<b>BULLETIN TYPE</b>	: Product improvement
<b>DATE</b>	: May 02 <sup>nd</sup> , 2016
<b>SUBJECT</b>	: Introduction of ZF/BOSCH bevel gear in front axle steering system
<b>TERMS &amp; CONDITIONS</b>	: No reimbursement will be awarded for carrying out this product improvement.

## APPLICATION

As from following units onwards, Van Hool is using again a ZF/BOSCH manufactured bevel gear instead of a PAILTON bevel gear in the front axle steering system. Because only the ZF/BOSCH bevel gear will be supplied as spare part, the ZF/BOSCH bevel gear should also be installed on older vehicles with PAILTON bevel gear whenever a replacement is necessary. This bulletin outlines how to change a bevel gear.

Model	VIN
CX35	48775
CX45	48940
TX45	41217
TD925US	42889
TDX25US	42899

## BEVEL GEAR TYPES

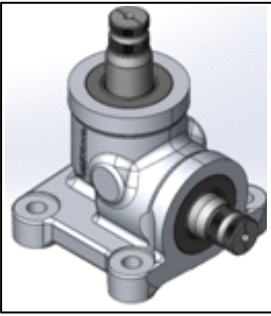
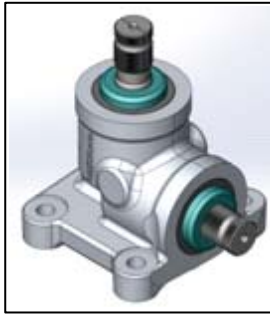
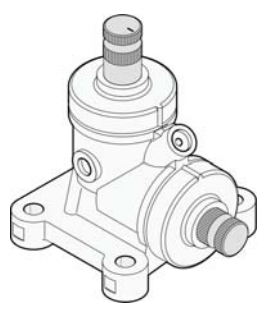
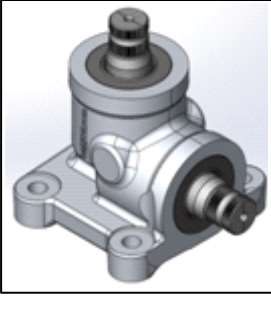
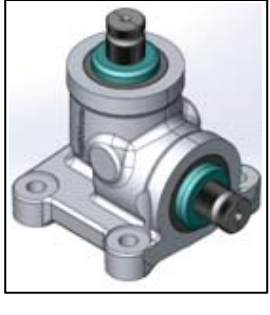
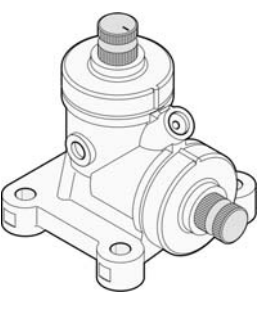
PAILTON and ZF/BOSCH bevel gears are interchangeable, but note that two different types of bevel gears are used: one with a **long** input shaft (A), one with a **short** input shaft (B). The application is different as shown in the table below.

Bevel gear version	Application
A (= long input shaft)	T2140, T2145, TX40, TX45 C2045, CX35, CX45 TD925US, TDX25US A330 AG300
B (=short input shaft)	A300K A300L

Also note that the ZF/BOSCH bevel gear has a mid-position which should be taken into account during the installation of the bevel gear.

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## **IDENTIFICATION**

	<b>Original Pailton bevel gear</b>	<b>Upgraded Pailton bevel gear (additional dust cover at input and output shafts)</b>	<b>New ZF/BOSCH bevel gear</b>
<b>With long input shaft</b>			
<b>With short input shaft</b>			

## **PARTS AND PRODUCTS:**

### **Old parts**

<b>VH reference</b>	<b>Description</b>
VH 11153766	Pailton bevel gear, with long input shaft (original and upgraded version have the same part number)
VH 11153765	Pailton bevel gear, with short input shaft (original and upgraded version have the same part number)

### **New parts**

<b>VH reference</b>	<b>Description</b>
VH 10598332	ZF/BOSCH bevel gear, with long input shaft
VH 10598331	ZF/BOSCH bevel gear, with short input shaft
VH 660207406 (4x)	Self-locking nut to secure bevel gear to chassis
VH 10513551 (1x)	Self-locking nut of elastic coupling clamping bolt
VH 10513551 (1x)	Self-locking nut of universal joint clamping bolt

- Old and new parts are interchangeable, but only the new ones are supplied as spare part.
- Parts can be purchased through the usual channels (for USA/Canada: through an "ABC customer Care & Parts Source Service Center").
- Waste disposal: dispose of removed components and used products in accordance with the local environmental regulations.
- If customers' current spare parts inventory includes a Pailton bevel gear please contact ABC Parts Source (1-877-427-7278) for instructions.

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## TO REMOVE/INSTALL BEVEL GEAR

### 1. Preparations

- Park the vehicle on a level-surfaced inspection pit with the front wheels straight. Apply the parking brake, stop the engine, switch off all systems and turn off the battery master switch on the dashboard.
- Turn off the mechanical battery switch.
- Put a “DO NOT OPERATE” tag on the instrument panel before beginning any inspection or performing any repair.
- Place chocks in front of and behind the drive axle wheels.
- Read the entire procedure before beginning to work.



### **WARNING!**

Observe safe shop practices at all times.

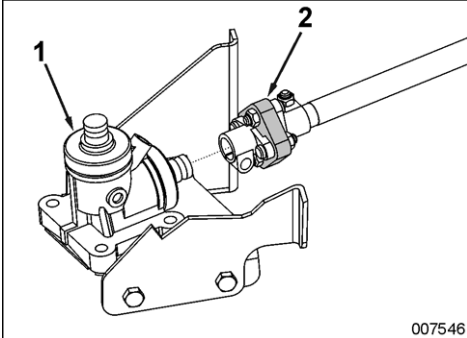
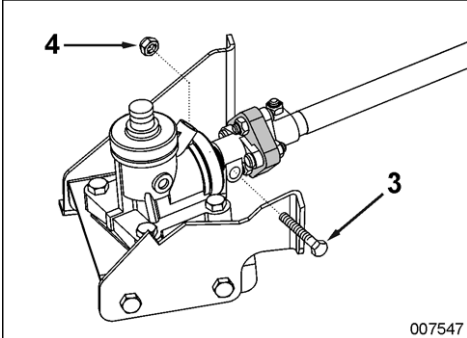
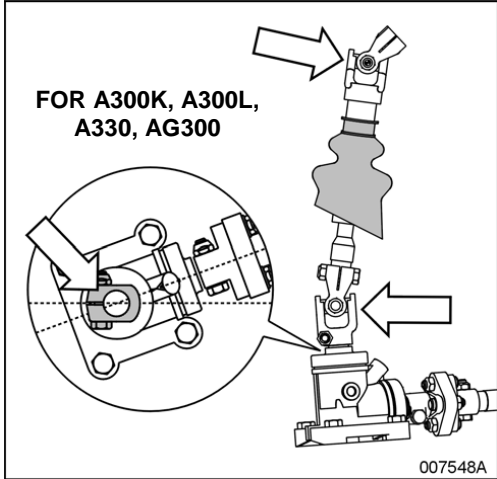
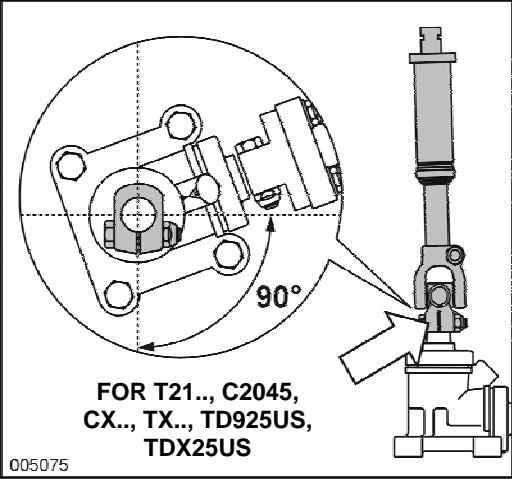
### 2. Procedure to remove the bevel gear

Step	Action
1	Make sure that the front wheels are in the straight-ahead position.
2	Remove the bolt of the steering column universal joint at the bevel gear.
3	Remove the bolt of the intermediate shaft elastic coupling at the bevel gear.
4	Remove the four bolts securing the bevel gear to the chassis and take away the bevel gear.

### 3. Procedure to install the new bevel gear

Step	Action
1	Make sure that the front wheels are in the straight-ahead position, and secure the steering wheel with the driver’s seat belt in a manner where it cannot be moved.
2	Rotate the bevel gear input shaft to align the marks on the dust cap and on the input shaft itself with the ridge on the housing. This is the “zero backlash” position of the bevel gear.

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<p><b>3</b></p>	<p>Slide output shaft of bevel gear (1) into elastic coupling (2) of the intermediate shaft. Make sure that the bevel gear remains in the “zero backlash” position during this step (refer to step 2).</p>  <p style="text-align: right;">007546</p>
<p><b>4</b></p>	<p>Secure the bevel gear to the chassis by using four M12 bolts with new self-locking nuts. If there are any shims found under the bevel gear on your vehicle, re-install them. Tighten the nuts to a torque of <math>70 \pm 10 \text{ Nm}</math> (<math>52 \pm 7 \text{ ft.lbf}</math>).</p>
<p><b>5</b></p>	<p>Install clamping bolt (3) with a new self-locking nut (4). If necessary, slacken the nut of the elastic coupling clamping bolt at the intermediate shaft side to ease installation of bolt (3).</p>  <p style="text-align: right;">007547</p>
<p><b>6</b></p>	<p>Tighten the clamping bolt(s) of the elastic coupling to a torque of <math>48 + 5 \text{ Nm}</math> (<math>35 + 3 \text{ ft. lbf}</math>).</p>
<p><b>7</b></p>	<p>Secure the universal joint of the steering column to the bevel gear with a bolt provided with a new self-locking nut.</p> <ul style="list-style-type: none"> <li>• For busses: ensure that the clamping slot of the universal joint is parallel to the longitudinal vehicle axis (as shown in the left figure).</li> <li>• For coaches: ensure that the clamping slot of the universal joint is perpendicular to the longitudinal vehicle axis (as shown in the right figure).</li> </ul> <p>Tighten the clamping bolt nut of the universal joint to a torque of <math>48+5\text{Nm}</math> (<math>35+3\text{ft.lbf}</math>).</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="373 1503 871 1980">  <p style="text-align: center;"><b>FOR A300K, A300L, A330, AG300</b></p> <p style="text-align: right;">007548A</p> </div> <div data-bbox="900 1503 1414 1980">  <p style="text-align: center;"><b>FOR T21..., C2045, CX..., TX..., TD925US, TDX25US</b></p> <p style="text-align: right;">005075</p> </div> </div>

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<b>8</b>	Remove the driver's seat belt. Start coach and make several full right and left hand turns to ensure proper steering operation.
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*Procedure complete.*

### **INFORMATION HANDLING:**

Important supplements and modifications of technical information not yet included in the manual are communicated by means of Service Bulletins.

### **VAN HOOL CUSTOMER PORTAL:**

Consult the Van Hool customer portal for the latest service documentation. Beside 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](http://www.vanhool.be), 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.