SERVICE BULLETIN

SB1709

ADDRESSEES	:	Owners and operators
VEHICLE MODEL	:	All vehicles with light-alloy wheels
MANUAL CHAPTER	:	12.06 Front axle – wheel hub 12.10 Drive axle – wheel hub 12.14 Trailing axle – wheel hub
BULLETIN TYPE	:	**Product improvement**
DATE	:	June 03rd, 2020
SUBJECT	:	**Introduction of wheel-end monitoring system (WEM)**
TERMS & CONDITIONS	:	This product improvement does not entitle to any reimbursement.

DESCRIPTION

Van Hool has released a wheel-end monitoring system (WEM) which can be installed on all vehicles equipped with light-alloy wheels. The WEM is installed at the outboard side of the wheel and monitors vibrations produced by the wheel bearing. It warns in case of bearing raceway spalling by flashing a red LED on the unit. The WEM is delivered with a magnet which is used to change from “transport” to “standstill” mode.



Figure 1: Wheel-end monitoring sensor with mounting plate (WEM)

CHECKING WHEEL BEARING CONDITION

The LED on the WEM blinks red at standstill when a bearing failure has been detected. Duration: 14 days.

Continued on next page.

INSTALLATION ON 8.25”/9” FRONT AXLE WHEELS AND 8.25”/9” SINGLE MOUNTED TRAILING AXLE WHEEL

Because the WEM comes together with a mounting plate, special sleeved flange nuts VH11469307 are allowed to compensate the thickness of the mounting plate. Compared with the originally installed wheel nut VH10516438, nut VH11469307 is threaded all the way up (refer to figure 3). To avoid wheel nut mixture during installation, Van Hool has decided to enlarge the kit with two compensation plates and ten wheel nuts VH11469307 so that the wheel has all around the same wheel nuts.

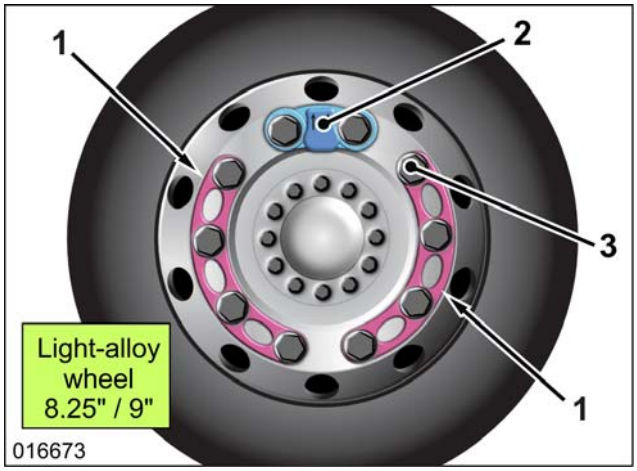


Figure 2: Installation of WEM on front axle wheels and single mounted trailing axle wheels (8.25” and 9”)

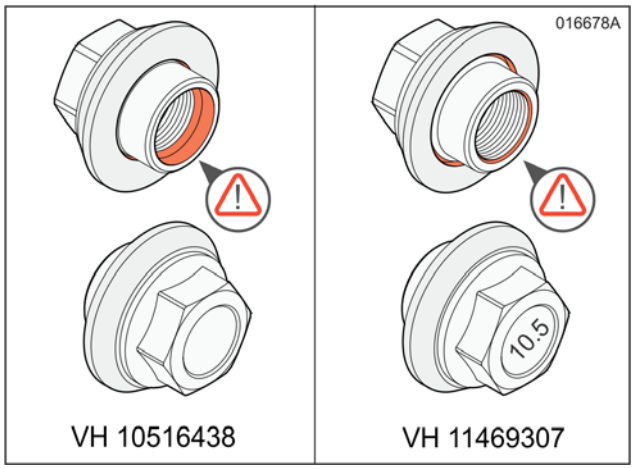


Figure 3: Difference between wheel nuts 10516438 and 11469307

1. **Compensation plate**
2. **WEM sensor with mounting plate**
3. **Wheel nut 11469307**

INSTALLATION ON 10.5” FRONT AXLE WHEELS AND 10.5” SINGLE MOUNTED TRAILING AXLE WHEEL

The thread of the originally installed wheel nuts is long enough to compensate the thickness of the sensor mounting plate.



Figure 4: Installation of WEM on 10.5” wheels

1. **WEM sensor with mounting plate**
2. **Originally installed wheel nut**

Continued on next page.

INSTALLATION ON 8.25”/9” DRIVE AXLE WHEELS AND 8.25”/9” DUAL MOUNTED TRAILING AXLE WHEELS

The thread of the originally installed wheel nuts is long enough to compensate the thickness of the sensor mounting plate.

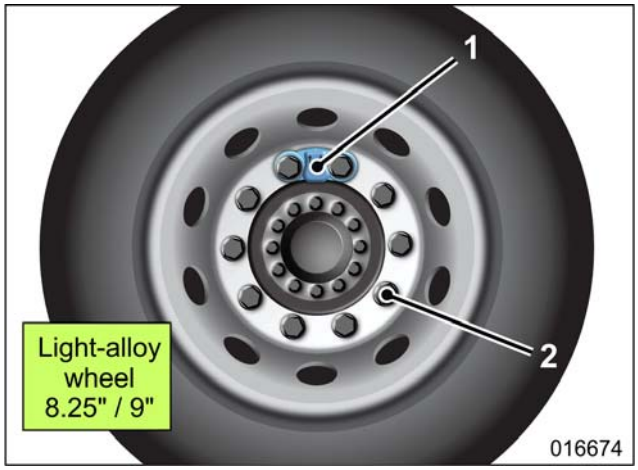


Figure 5: Installation of WEM on drive axle wheels and dual mounted trailing axle wheels (8.25” and 9”)

1. **WEM sensor with mounting plate**
2. **Wheel nut 10941058**

INSTALLATION ON STEEL WHEELS

The installation of a WEM on steel wheels is not allowed because the threads of the wheel nuts cannot compensate the thickness of the mounting plate.



Figure 6: Installation on steel wheels is not allowed!

DRAFT review only.

Continued on next page.

COMPONENTS

Wheel-end monitoring sensor with mounting bracket (WEM) only		
VH reference	**Description**	**Quantity***
11718941	Wheel-end monitoring sensor with mounting bracket (WEM)	1

*Quantity suited for one wheel-end

Parts of retrofit kit VH11725750 (= kit with wheel-end monitoring sensor!) (for 8.25”/9” front axle wheels and 8.25”/9” single mounted trailing axle wheels)		

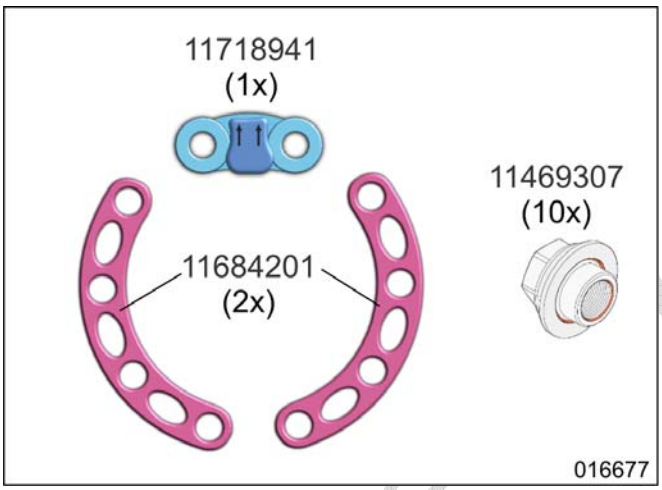


Figure 7

VH reference	Description	Quantity*
11718941	Wheel-end monitoring sensor with mounting bracket (WEM)	1
11684201	Compensation plate	2
11469307	Special wheel nuts	10

*Quantity suited for one wheel-end

Parts of retrofit kit VH11726375 (= kit without wheel-end monitoring sensor!) (for 8.25”/9” front axle wheels and 8.25”/9” single mounted trailing axle wheels)		
VH reference	**Description**	**Quantity***
11684201	Compensation plate	2
11469307	Special wheel nuts	10

*Quantity suited for one wheel-end

DRAFT: For review only.

JOB QUALIFICATION:

The task has to be carried out by an experienced automotive technician.

SPECIAL TOOLS, EQUIPMENT OR SERVICES:

This job requires no special tools, equipment or services.

Continued on next page.

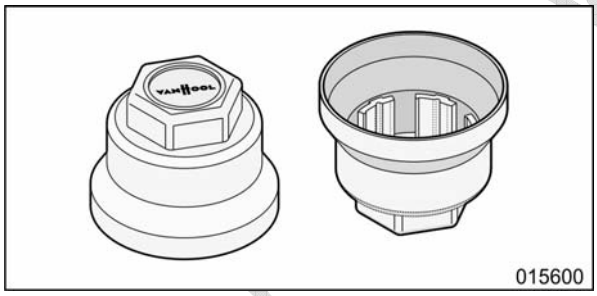
PREPARATIONS:

- Park the vehicle 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.
- Install a "DO NOT OPERATE" warning message on the steering wheel.
- Put chocks in front of and behind the front-axle wheels.
- **Read the entire procedure before starting to work.**

WARNING!

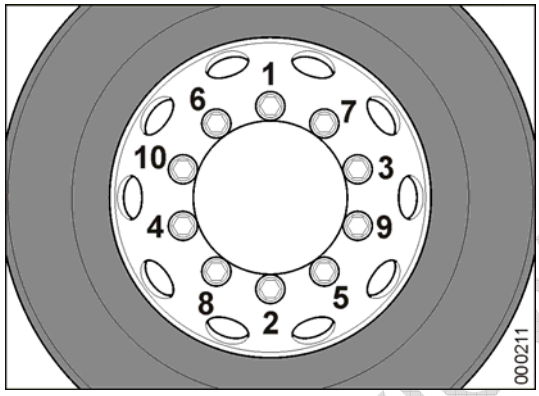
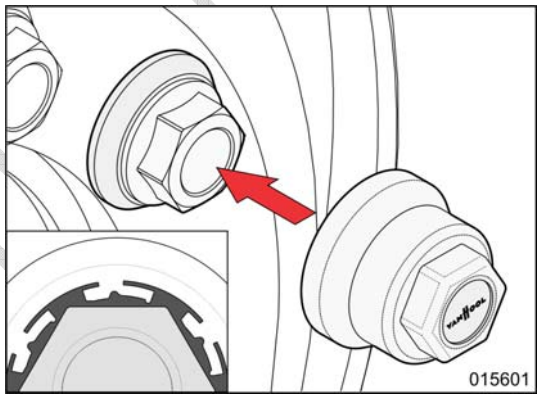
Observe safe shop practices at all times.

PROCEDURE:

Step	Action
1	If installed, turn two adjacent wheel-nut caps counterclockwise with a socket wrench until they are free.  015600 **Figure 8: Wheel-nut cap**
2	Remove the two adjacent wheel nuts.
3	Orientate the WEM on the wheel bolts as indicated in figure 9. Arrow points towards tire!  016679 **Figure 9: Proper orientation of WEM**
4	• **For front axle wheels and single mounted trailing axle wheels:** secure the WEM with two special wheel nuts from the kit. • **For drive axle wheels and dual mounted trailing axle wheels:** secure the WEM with the formerly removed wheel nuts.

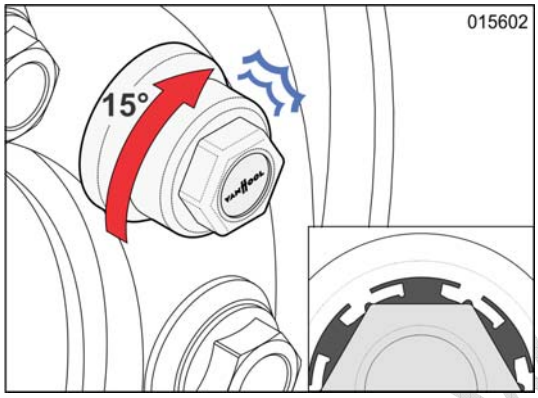
DRAFT PROOF for review only.

Continued on next page.

5	**For 8.25”/9” front axle wheels and 8.25”/9” single mounted trailing axle wheels:** remove four adjacent wheel nuts and install one of the two compensation plates by using four special wheel nuts from the kit.
6	**For 8.25”/9” front axle wheels and 8.25”/9” single mounted trailing axle wheels:** repeat step 5 for the other compensation plate.
7	• **For 8.25”/9” front axle wheels and 8.25”/9” single mounted trailing axle wheels:** tighten the wheel nuts evenly by alternately turning every nut progressively further each time, until the torque of 600 ± 20 Nm (445 ± 15 ft.lbf) is reached. Tightening sequence: refer to figure 10.  **Figure 10** • **For 10.5” front axle wheels and 10.5” single mounted trailing axle wheels:** tighten the two wheel nuts to a torque of 600 ± 20 Nm (445 ± 15 ft.lbf) . • **For drive axle wheels and dual mounted trailing axle wheels:** tighten the two wheel nuts to a torque of 600 ± 20 Nm (445 ± 15 ft.lbf) .
8	Place the wheel-nut caps loosely on the wheel nut.  **Figure 11**

DRAFT for review only.

Continued on next page.

9	**CAUTION!** **Use only a socket wrench to secure the wheel nut caps.** Using a socket wrench, turn the wheel nut caps approximately 15° clockwise until you feel resistance.  **Figure 12**
10	Change the WEM from "**Transport Mode**" to "**Standstill Mode**" according to the instructions under "Changing mode description".

MODE DESCRIPTION:

The WEM has five modes of operation:

- the "**Transport Mode**" is used for part transportation only;
- the "**Standstill Mode" and "Operating Mode**" are the ones used in application when mounted on the vehicle;
- the "**Configuration Mode**" is used after wake up to commission the WEM;
- the **"Reset/Remove Mode"** is used to enable a connection with the mobile App for WEM reset and/or decommissioning.

CHANGING MODE DESCRIPTION:

The WEM comes in "**Transport Mode**" and must be put into "**Configuration Mode**" using the magnet that comes with the WEM. In "**Configuration Mode**", the WEM can be fully configured via the Mobile app in order to be used. Mode switching is indicated by a LED lighting. When configured, the WEM automatically goes to "**Standstill Mode**". The WEM handles itself the switching from "**Standstill Mode**" to "**Operating Mode**" according to vehicle movement.

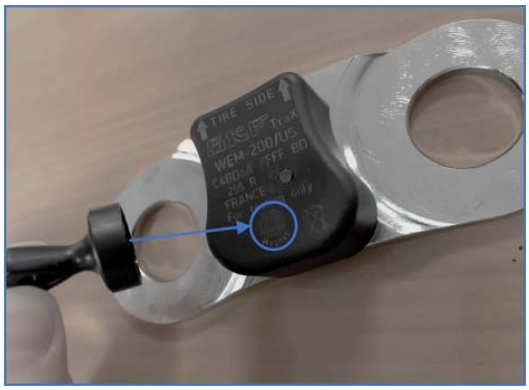


Figure 13: Use the magnet to change mode of WEM

Continued on next page.

DRAFT! For review only.

Sensor state	Action	Result
Transport Mode	Put the magnet on the plastic housing until the LED lights.	LED lights **green** for 1 second. The WEM goes to "**Configuration Mode**"
Configuration Mode	Configure the product with the Mobile App	LED switches off. The WEM goes to "**Standstill mode**".
Configuration Mode	No action during 30s	LED switches off. The WEM goes back to "**Transport mode**".
Standstill Mode or Operating Mode	Put the magnet on the plastic housing until the LED lights.	LED lights **green**. The WEM goes to "**Reset/Remove Mode**".
Reset/Remove Mode	Reset the WEM with the Mobile App.	LED switches off. Bearing damage cleared. Temperature cleared. The WEM goes back to "**Standstill mode**".
Reset/Remove Mode	Remove configuration of the WEM with the Mobile App.	LED switches off. The WEM goes back to "**Transport Mode**".
Reset/Remove Mode	No action during 30s	LED switches off. The WEM goes back to "**Standstill Mode**".

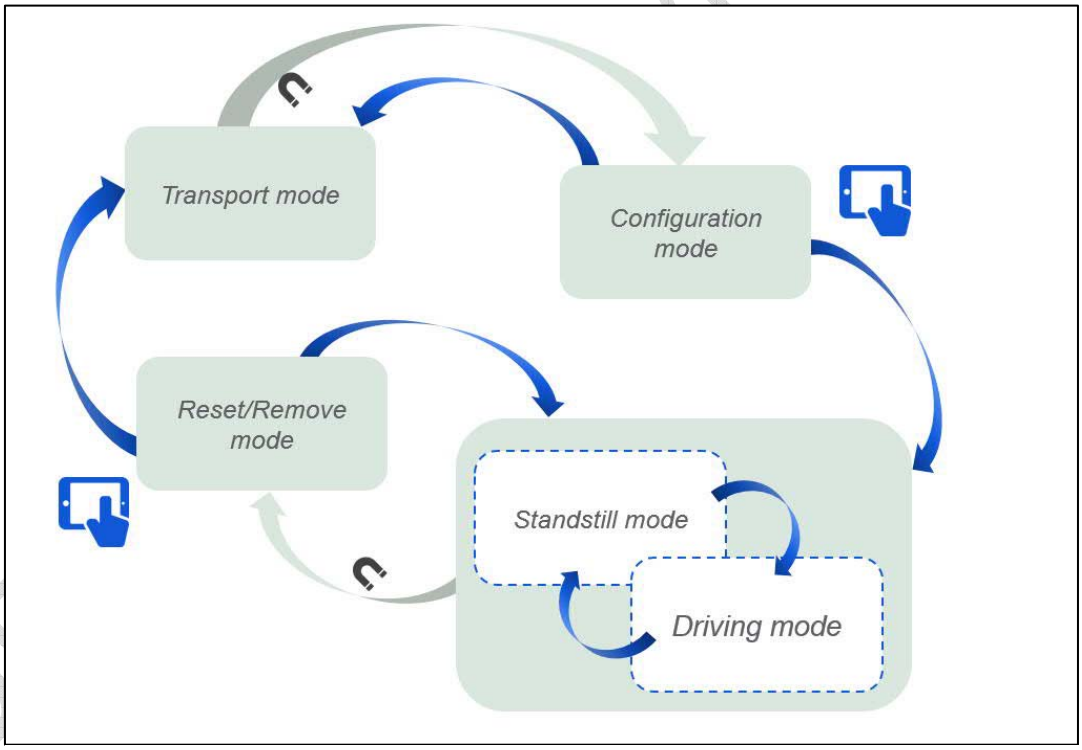


Figure 14: Changing mode diagram

CONFIGURATION:

The configuration is mandatory to use the WEM. Use the SKF TraX Mobile App(1) to configure the WEM following the procedure described in the separate SKF TraX User Manual.

(1) The TraX Mobile App is an i-OS application to be installed on a smart device.

Continued on next page.

WHAT TO DO WITH “WEM” IN CASE OF A WHEEL/TIRE CHANGE?

Step	Action
1	Make sure the WEM is in “**Standstill Mode**”.
2	Put the magnet until the LED lights green. WEM changes to “**Reset/Remove Mode**”.
3	Within 30 seconds, change to “**Transport Mode**” using the Mobile App.
4	Put the magnet until the LED lights green. WEM goes to “**Configuration Mode**”.
5	Within 30 seconds, configure the WEM using the Mobile App.

RESET OF WEM:

The WEM can be reset three times. A reset shall be used to clear a bearing damage after having replaced the damaged bearing. Use the Mobile App to reset the WEM. After three resets, the WEM stays in “**Failure Mode Active**” and does not perform any vibration analysis any more: a WEM change is needed.

LIFETIME OF WEM:

The estimated WEM lifetime is 3.5 years.

RETIGHTENING WHEEL NUTS:

After mounting the WEM, retighten the wheel nuts after the first 50 km (30 miles) and again after the next 100 km (60 miles). After that, check the torque daily until finally tight. Wheel nut slackening is explained by the fact that in the beginning the fasteners set, so that part of the original torque is lost.

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

VAN HOOL CUSTOMER PORTAL:

Consult the customer portal regularly 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, 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.

DRAFT For Review only.