WORK PROCEDURE

for distributors and service points

WP1108

ADDRESSEES	:	ABC Customer Care and Parts Source
VEHICLE MODEL	:	TDX.. vehicles equipped with Iteris lane departure warning system
MANUAL CHAPTER	:	11.04 Control systems – Driver assistance systems
DOCUMENT TYPE	:	**Informative**
DATE	:	November 14th, 2019
SUBJECT	:	**To retrofit from Iteris to Wabco LDW2 lane departure warning system**

INTRODUCTION

Van Hool has released a work procedure to assist ABC Companies in successfully retrofitting a TDX.. coach factory equipped with an Iteris LDW system to a Wabco LDW2 system. The reason for this work procedure is the spare parts production stop for the Iteris LDW system.

Figure 1: Iteris lane-departure warning system camera

Figure 2: Wabco LDW2 lane-departure warning system camera

PREPARATIONS

- Park the vehicle on a level floor.
- Apply the parking brake.
- Stop the engine.
- Switch off all systems and turn off the battery isolation switch on the dashboard.
- 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.

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SPECIAL TOOLS

- LDW2 camera positioning tool: self-fabricated cardboard template (refer to figure 17) or Van Hool caliper VH91400412 (refer to figure 18)
- Removal tool for MCP 2.8 connector terminal: VH10541368
- Removal tool for MCP 1.5K connector terminal: VH11063197

COMPONENTS AND PRODUCTS:

Parts of retrofit kit VH11687930

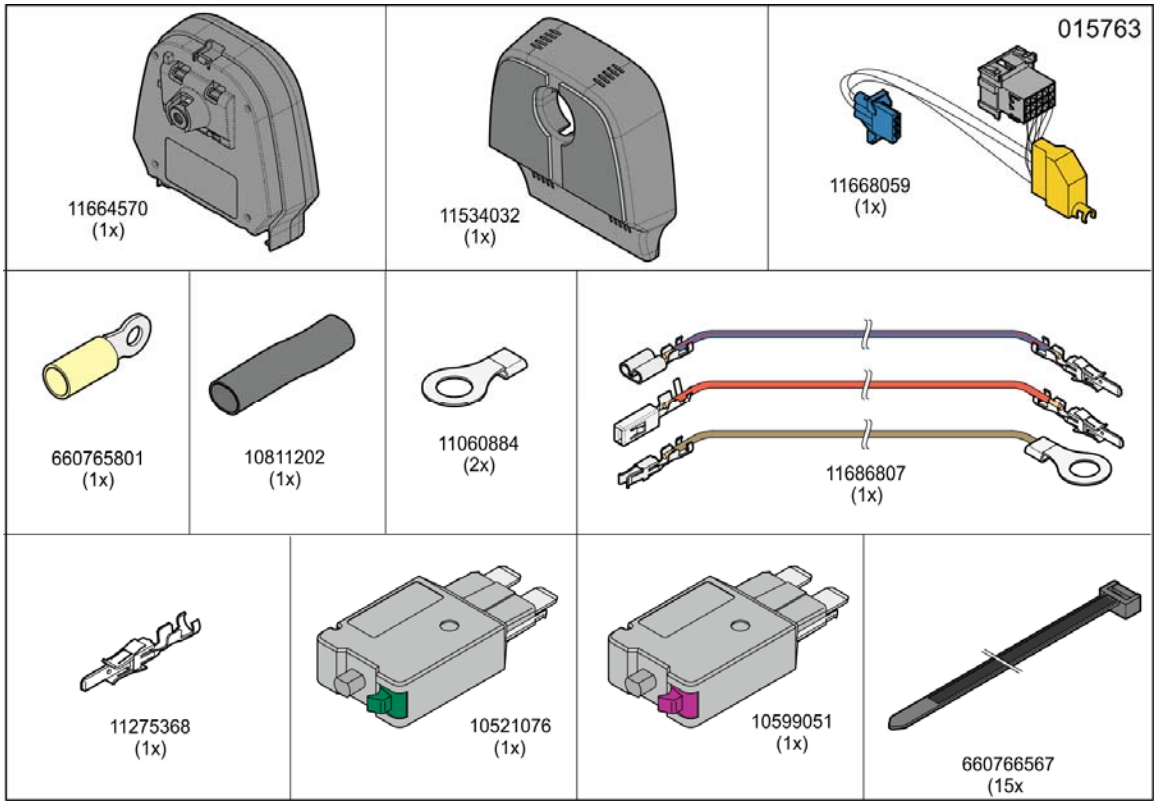

Figure 3

VH reference	Description	Qty
11664570	Wabco LDW2 camera (VH11626943) with parameters (VH11664484)	1
11534032	Camera support	1
11668059	Adapter cable	1
11686807	Electric wire kit (red, blue-red, brown)	1
11060884	Cable terminal	2
10521076	Circuit breaker 6A	1
105299051	Circuit breaker 3A	1
660766567	Cable tie	15
660765801	Cable terminal	1
10811202	Heat shrink tubing	1

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PROCEDURE:

Step	Action
1	Disconnect the connector socket from the Iteris camera.
2	Remove the Iteris camera from the windshield as described under “STEP 2 IN DETAIL”.
3	Modify the vehicle wiring as described under “STEP 3 IN DETAIL”.
4	Install the support of the Wabco LDW2 camera on the windshield as described under "STEP 4 IN DETAIL".
5	Secure the Wabco LDW2 camera into the support as described under "STEP 5 IN DETAIL".
6	Calibrate the Wabco LDW2 camera as described in work procedure WP984 "To calibrate LDW2 lane-departure warning system camera".
7	Register the works through the registration button located behind the work procedure on the Van Hool customer portal. Write the text "WP1108 completed on VIN…" in the "Remark" field.

End of procedure.

STEP 2 IN DETAIL: To remove Iteris camera from windshield

NOTE: Use a spatula to remove the support. Any other tool, e.g. a screwdriver, might damage the windshield.

Step	Action
2.1	Introduce a spatula between the glass and a corner of the support in order to detach the adhesive layer.
2.2	Starting in a corner, slowly detach the support from the glass by pulling.
2.3	Remove the remainders of glue on the windshield. This can be done easily by pulling the remainders of glue somewhat loose and rolling them with a finger.

STEP 3 IN DETAIL: To modify vehicle wiring

Step	Action
3.1	Remove the two small screws indicated in figure 4 and take away the handle.

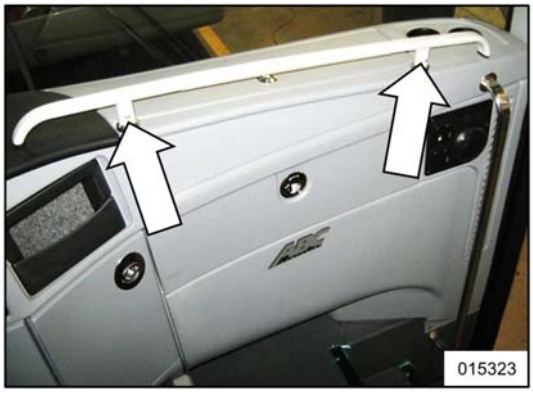

Figure 4

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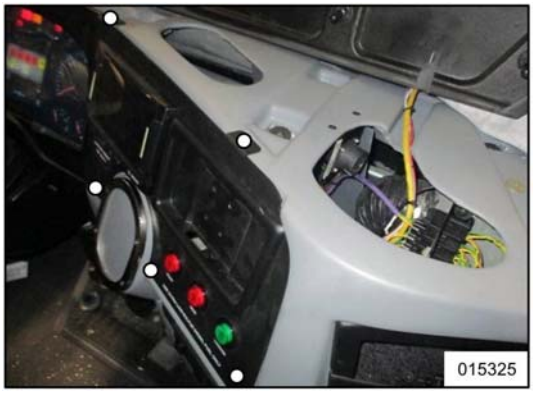
3.2	Remove the dashboard cover panel.  **Figure 5**
3.3	Undo and remove the Torx screws securing the dash panel indicated in figure 6. Tilt the panel forwards so that the rear can be reached.  **Figure 6**
3.4	**At the connector socket disconnected from the Iteris camera:** a. Remove the cable terminals of contact numbers 7, 8, 9 and 10 by using removal tool VH10541368. b. Cut off the cable terminals and isolate the wire ends with a heat shrink tubing. c. Introduce the female cable terminal of the red wire from the kit into contact number 7 of the connector socket. d. Route the other end of the red wire to the brown 36-pin connector P51. e. Secure the red wire on the way to other wiring with some cable ties from the kit.

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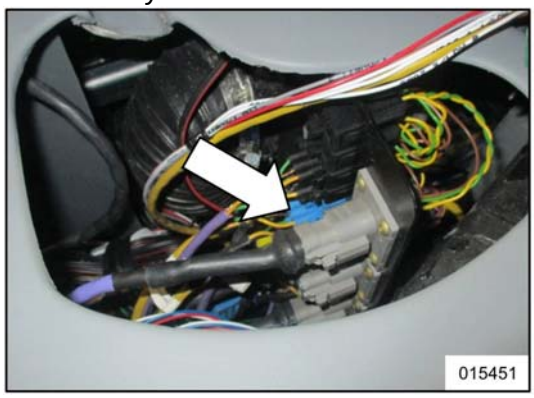
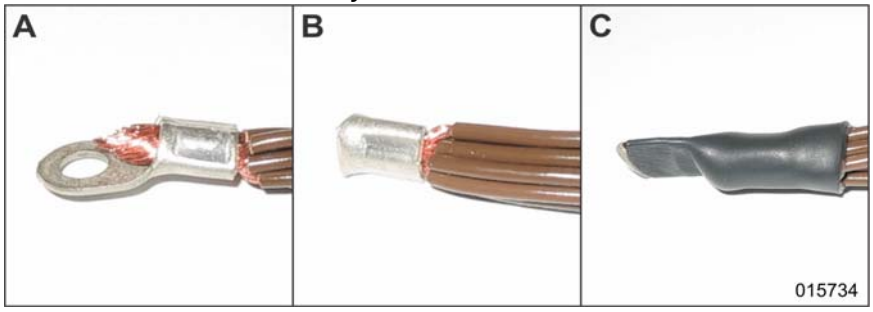
3.5	Connect adapter cable 11668059 from the kit as follows: a. Connect the 15-pin connector plug of the adapter cable to the connector socket disconnected in step 1. b. Route the blue 3-pin connector socket of the adapter cable to the CAN splitter located behind the dashboard cover panel removed in step 3.2, and connect it to a free blue CAN splitter connector plug (refer to figure 7). c. Route the remaining 16-pin connector socket of the adapter cable to the new camera location. d. Secure the wires on the way with some cable ties from the kit.  **Figure 7**
3.6	**Behind the instrument panel:** a. Unlock and disconnect brown 36-pin connector P51. Unlock the secondary locking device of the connector plug by pushing the big yellow button at the plug side. b. Remove on connector P51 the cable terminal of contact number 3 by using removal tool VH11063197 and introduce this cable terminal into contact number 6 of connector P51. c. Introduce the cable terminal of the in step 3.4d added red wire in contact number 3 of connector plug P51. d. Cut off the cable terminal of the in-line junction point DVB11 (identifiable by the bundle of five grey wires). e. Strip back the grey electric wires over a distance of 15 mm (0.58 inch). f. Separate the five grey wires of junction point DVB11 into two bundles: one bundle containing the grey wires with printing “P51”, “S807” and “LDW”; the second bundle containing the two other grey wires with printing “M526“. g. Crimp the grey wires with printing “P51”, “S807” and “LDW” to cable terminal 660765801 from the kit (refer to figure 8A). Cut off the eye of the cable terminal (refer to figure 8B) and insulate the remaining part of the cable terminal with heat shrink tubing 10811202 from the kit (refer to figure 8C). h. Crimp the grey wires with printing “M526.1” and “M526.2” each to a cable terminal 11060884 from the kit. i. Locate a ground stud and secure the grey wires with printing “M526.1” and “M526.2” to the ground stud. j. Secure the wires on the way with some cable ties from the kit.  **Figure 8**

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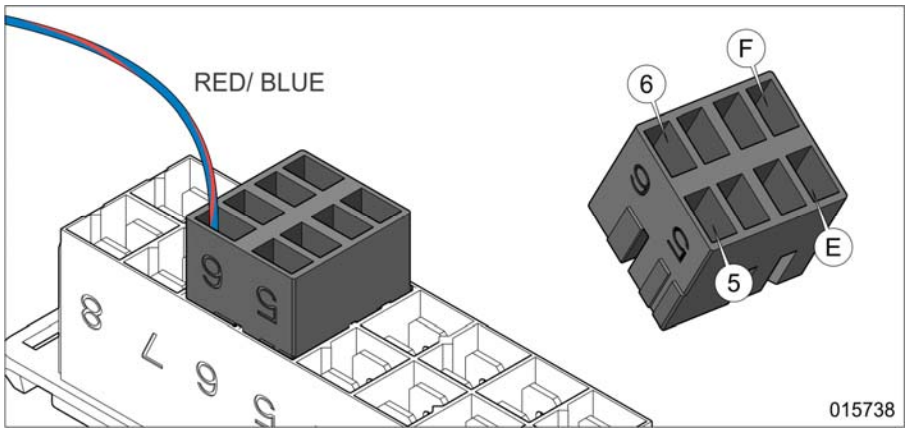
3.7	**In the main junction box (EK1):** a. Locate the blue 36-pin connector P151. b. Disconnect the connector. Remove the secondary locking device from the connector plug. c. Introduce the male cable terminal of the red-blue wire from the kit into contact number 6 of connector plug P151. Route the other end of this wire to fuse holder ZB09. Reinstall the secondary locking device from the connector plug. d. Connect and lock connector P151. e. Introduce the female cable terminal of the blue-red wire into connection “6” of socket “5-6-E-F” of fuse holder ZB09 (refer to figure 9). f. Install 6A circuit breaker 10521076 from the kit into location 6 of fuse holder ZB09. g. Replace 8A circuit breaker Z15.3 by 3A circuit breaker 10599051 from the kit. h. Locate node 2 of the multiplex system. Disconnect 22-pin connector socket “A” from the node by first depressing the locking tab and then carefully separating it from the node. The connector reference (A, B, C …) has been stamped into the node housing. i. Fold the connector socket side covers open. j. Install the brown wire from the kit into contact number 3 of the connector socket. k. Close the connector socket sides and connect it again to the node. l. Secure the ring terminal of the brown electrical wire to a ground stud in the junction box. Secure the brown wire on the way to wiring making the same routing with cable ties from the kit.  **Figure 9**

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STEP 4 IN DETAIL: To install new support of lane-departure warning system camera on windshield

NOTE: Never reuse a removed support! The support has inevitably been deformed at removal. Discard the used support according to the locally applicable guidelines regarding protection of the environment.

NOTE: To position the lane-departure warning system camera properly on the windshield, you have to use a self-fabricated template (refer to figure 17 for the dimensions) or caliper VH91400412 (refer to figure 18).

NOTE: The support of the lane-departure warning camera is provided with a special adhesive layer with limited storage life. The mounting expiry date is mentioned on an adhesive label on the support (see figures 10 and 11). Never install a support of which the expiry date has elapsed.

Figure 10: Location of adhesive label with expiry date on support

Figure 11: Mounting expiry date of support of lane-departure warning system (typical: February 2018)

Step	Action
4.1	Thoroughly clean the mounting area of the camera on the windshield. To this end, use a mix of 50% demineralized water and 50% isopropyl alcohol.
4.2	Position the lane-departure warning system camera by using the self-fabricated template or the Van Hool caliper. Make sure that the tool fits tightly against the windshield rubbers. Tape the tool onto the windshield.
4.3	Remove the protective film from the adhesive layer and glue camera support 11534032 from the kit onto the windshield as indicated in figure 13.

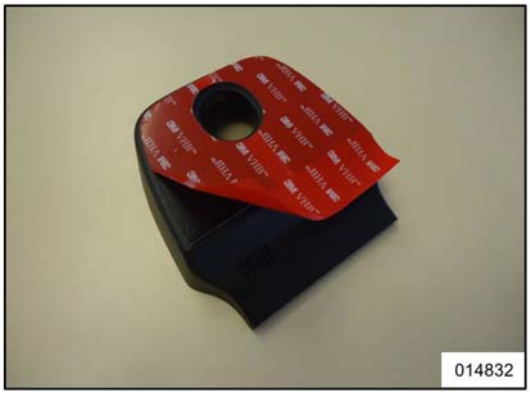

Figure 12: To remove protective film from adhesive layer

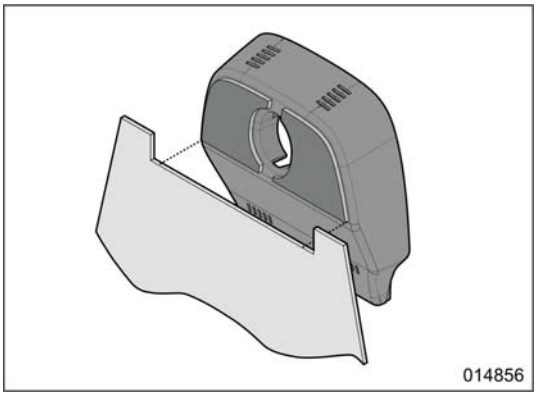

Figure 13: To glue support onto windshield (cardboard template shown)

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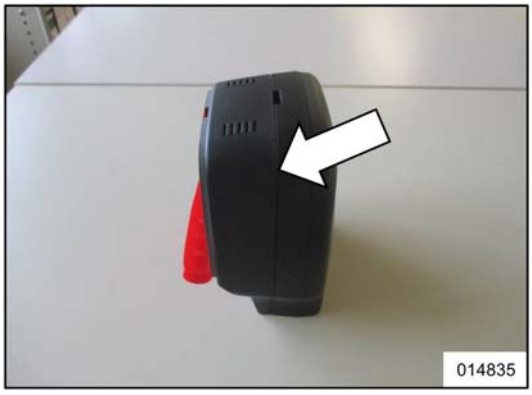
4.4	By hand, press the support against the windshield for at least 5 seconds. This activates the adhesive layer. Repeat this at different places over the area with adhesive layer.
4.5	Check from the outside whether the adhesive layer is adequately glued to the windshield all over. A single bubble is no problem, but the adhesive layer should be glued to the windshield for at least 3/4 of its surface. Press the support some more from inside if necessary.
4.6	*NOTE: After 20 minutes, the adhesive layer reaches 50% of its adhesive force. Full adhesive force is only obtained after a couple of hours.* Let the adhesive layer rest for approximately 20 minutes before continuing the installation procedure of the lane-departure warning system camera.

STEP 5 IN DETAIL: To secure lane-departure warning camera into support

Step	Action
5.1	Connect the yellow 16-pin connector socket from the adapter cable to the new camera.
5.2	Remove, if present, the protective cap from the lens. Do not touch the camera lens with your fingers! The slightest finger print or dust on the lens can cause incorrect warnings of the lane-departure warning system.
5.3	Starting at the bottom, install the camera in the in step 4 installed support (refer to figure 14). Then press the top in the support until you hear a click (refer to figure 15). The camera is now secured in the support.  **Figure 14**  **Figure 15**
5.4	Check whether the camera is introduced equally far into the support all round. The camera is properly installed if the seam is equal all round.  **Figure 16**

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TEMPLATE/CALIPER TO POSITION LANE-DEPARTURE WARNING SYSTEM CAMERA ON WINDSHIELD

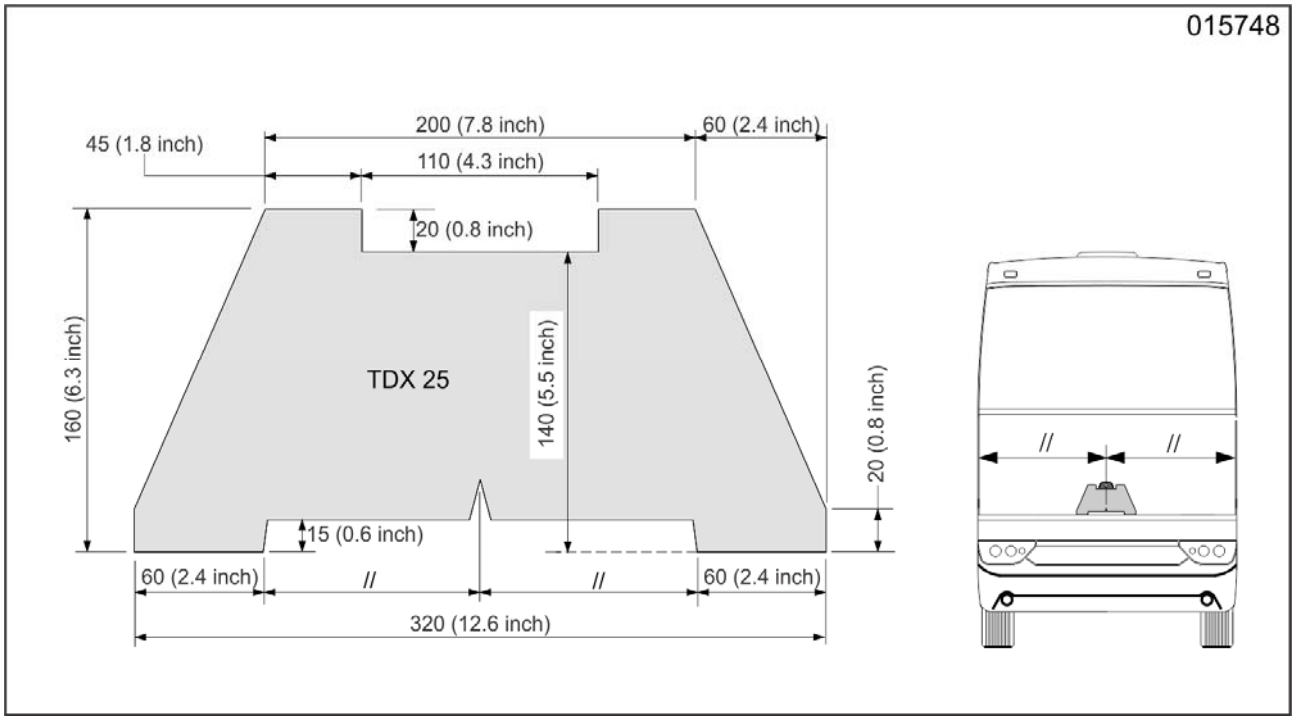

Figure 17: Dimensions of self-fabricated cardboard template to position the LDW2 camera at the inside of the windshield

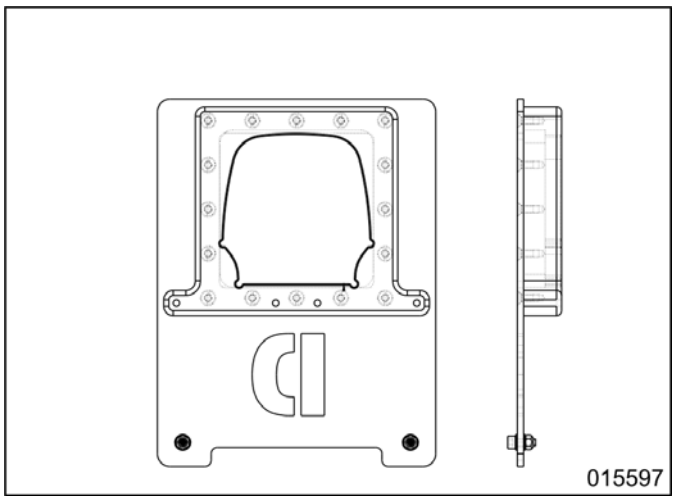

Figure 18: Caliper VH91400412 to position LDW2 camera at the inside of the windshield

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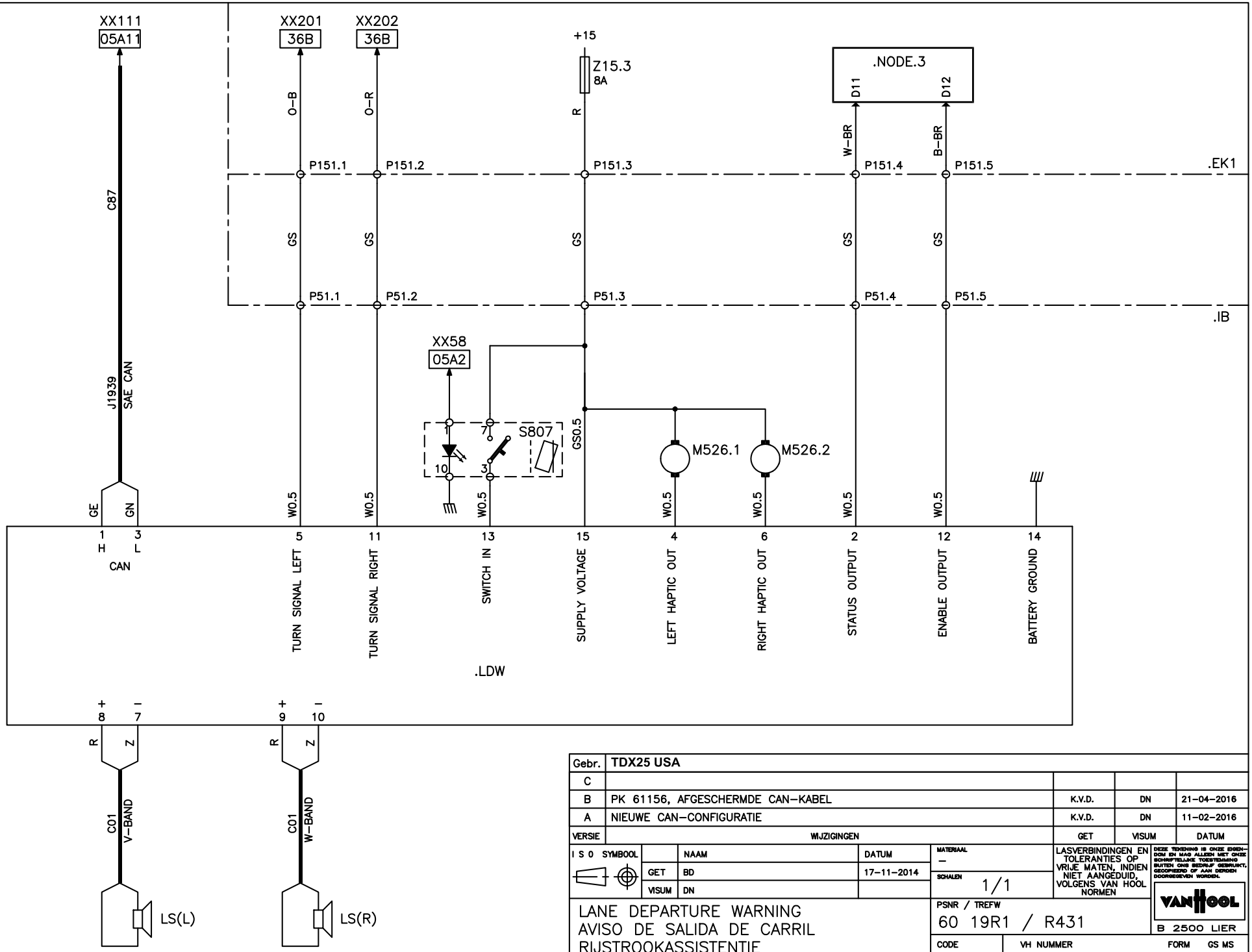
DISCLAIMER:

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 himself thoroughly that neither the safety of his employees or agents, nor the safety or usefulness of any products, will be jeopardized by any procedure selected.



ITERIS

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C				
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A	NIEUWE CAN-CONFIGURATIE	K.V.D.	DN	11-02-2016
VERSIE	WIJZIGINGEN	GET	VISUM	DATUM

ISO SYMBOOL		NAAM	DATUM
	GET	BD	17-11-2014
	VISUM	DN	

MATERIAAL –

SCHALEN 1/1

LASVERBINDINGEN EN TOLERANTIES OP VRIJE MATEN, INDIEN NIET AANGEDUID, VOLGENS VAN HOOL NORMEN

LANE DEPARTURE WARNING
AVISO DE SALIDA DE CARRIL
RIJSTROOKASSISTENTIE
L'ALERTE DE DERIVE

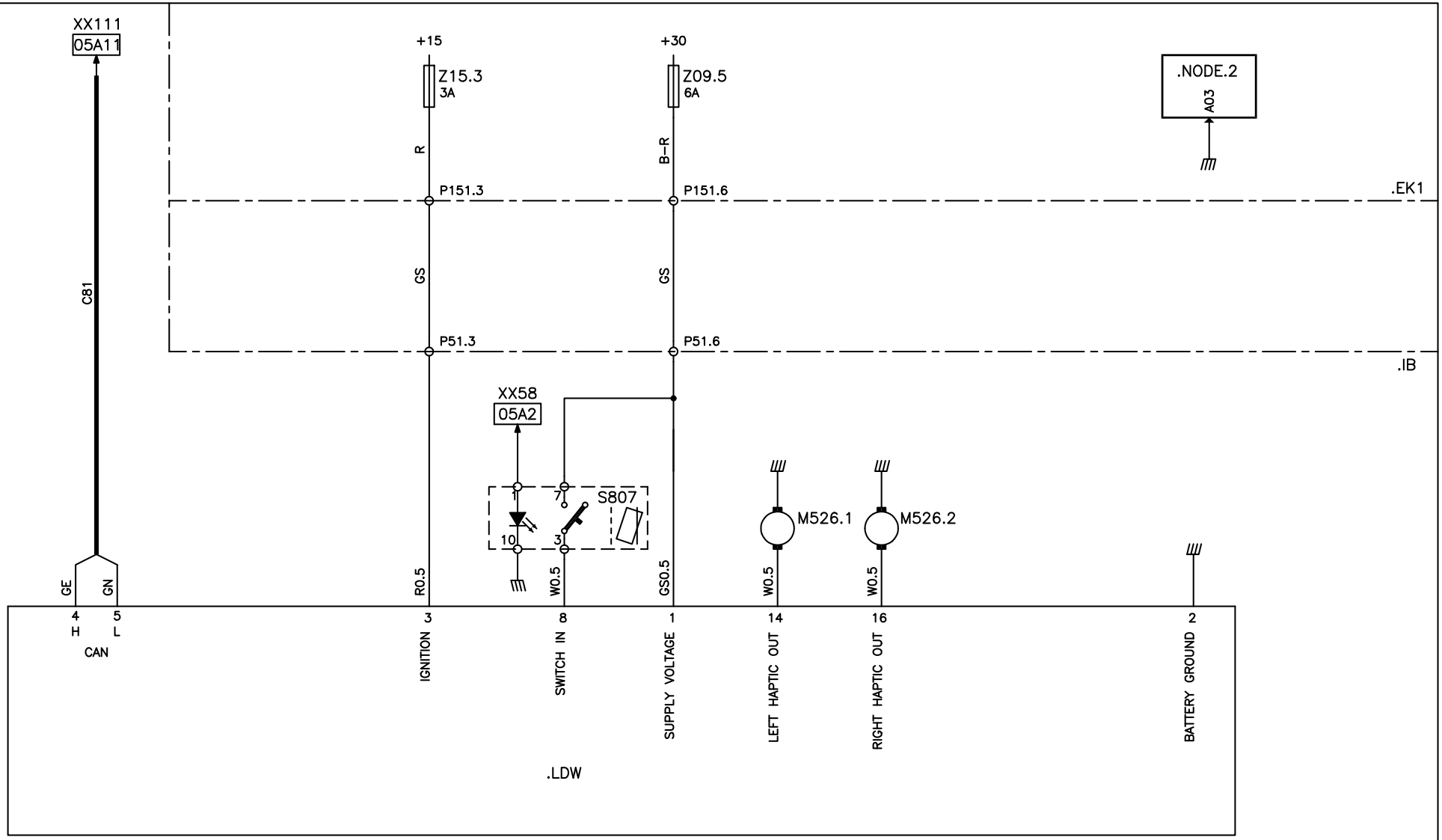
PSNR / TREFW 60 19R1 / R431

VANHOOL B 2500 LIER

CODE –

VH NUMMER 11439576/3/ –

FORM GS MS



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B	PK 71161, ZEKERINGSWAARDEN GEWIJZIGD	K.V.D.	DN	22–11–2017
A	TOEVOEGEN MASSABRUG OP NODE 2 A03	K.V.D.	DN	17–11–2017
VERSIE	WIJZIGINGEN	GET	VISUM	DATUM

ISO SYMBOOL		NAAM	DATUM
	GET	K.V.D.	12–10–2017
	VISUM	DN	

MATERIAAL –

SCHALEN 1/1

LASVERBINDINGEN EN TOLERANTIES OP VRIJE MATEN, INDIEN NIET AANGEDUID, VOLGENS VAN HOOL NORMEN

VANHOOL

B 2500 LIER

LANE DEPARTURE WARNING (WABCO)
AVISO DE SALIDA DE CARRIL (WABCO)
RIJSTROOKASSISTENTIE (WABCO)
L'ALERTE DE DERIVE (WABCO)

PSNR / TREFW 60 19R1 / R431

CODE	VH NUMMER	FORM	GS MS
–	11592422/3/	–	

WABCO