OnLane™

LANE DEPARTURE WARNING SYSTEM

INSTALLATION MANUAL

WABCO

Table of contents

Edition 2
Version 2 (12.2016)
815 010 197 3 (en)

This publication is not subject to an updating service.
You will find the current version at:
http://www.wabco.info/i/641

1 General Information

Purpose of the document

This publication applies to employees of vehicle manufacturers and workshops for repairing utility vehicles with a knowledge of vehicle electronics. This explains the installation and start-up of the WABCO OnLane™ lane departure warning system in commercial vehicles.

Copyright and trademark notice

Symbols used

⚠ WARNING	**Specifies a potentially hazardous situation** Not observing the safety instruction can result in severe injuries or death. – *Follow the instructions in this warning note to avoid injury or death.*
⚠ CAUTION	**Specifies a potentially hazardous situation** Specifies a possible hazardous situation Not observing the safety instruction can result in minor or moderately severe injuries. – *Follow the instructions in this warning note to avoid any injuries.*
CAUTION	**Specifies possible material damage** Not observing the safety instruction can lead to material damage. – *Follow the instructions in this warning note to avoid any material damage.*

! Important instructions, information, or tips that you should always observe.

Reference to information on the Internet

– Action step

⇨ Consequence of an action

- List

Technical documents

– Open the WABCO INFORM online product catalogue: http://inform.wabco-auto.com

– Search for documents by entering the document number in the *product number* search field.

The WABCO online product catalogue INFORM provides you with convenient access to the complete technical documentation.

All documents are available in PDF format. Please contact your WABCO partner for printed versions.

Please note that the publications are not always available in all language versions.

DOCUMENT TITLE	DOCUMENT NUMBER
OnLane™ – Installation instructions	815 XX0 197 3
OnLane™ – Driver information	815 XX0 202 3
Diagnosis and test equipment – Product overview	815 XX0 037 3

*Language code XX: 01 = English, 02 = German, 03 = French, 04 = Spanish, 05 = Italian, 06 = Dutch, 07 = Swedish, 08 = Russian, 09 = Polish, 10 = Croatian, 11 = Romanian, 12 = Hungarian, 13 = Portuguese (Portugal), 14 = Turkish, 15 = Czech, 16 = Chinese, 17 = Korean, 18 = Japanese, 19 = Hebrew, 20 = Greek, 21 = Arabic, 24 = Danish, 25 = Lithuanian, 26 = Norwegian, 27 = Slovenian, 28 = Finnish, 29 = Estonian, 30 = Latvian, 31 = Bulgarian, 32 = Slovakian, 34 = Portuguese (Brazil), 98 = multilingual, 99 = non-verbal

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- Training
- System support
- Order management

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2 Safety information

⚠ Observe all required provisions and instructions:

- Read this publication carefully.
  Adhere to all instructions, information and safety information to prevent injury to persons and damage to property.
  WABCO will only guarantee the security, reliability and performance of their products and systems if all information in this publication is adhered to.
- Always follow the specifications and instructions of the vehicle manufacturer.
- Observe all accident regulations of the respective company as well as regional and national regulations.

⚠ Make provisions for a safe work environment:

- Only trained and qualified technicians may carry out work on the vehicle.
- Use personal protective equipment if required (protective goggles, respiratory protection, ear protectors, etc.).
- Pedal actuations can lead to severe injuries if persons are in the vicinity of the vehicle. Make sure that pedals cannot be actuated as follows:
  - Switch the transmission to "neutral" and actuate the park brake.
  - Secure the vehicle against rolling by using chocks.
  - Fasten a visible note to the steering wheel indicating that work is being performed on the vehicle and that the pedals are not to be actuated.

3 Introduction

The OnLane™ system is a lane departure warning system for installation or retrofit in vehicles.

A camera in the windscreen watches the lane markings and warns the driver with a warning sound (via 2 loudspeakers) or by vibrating the driver's seat in the event of any inadvertent lane-change.

The system monitors indicator signalling, the brake light switch and the driving speed. The system is thus able to detect intended lane-changes and as a result does not warn you.

CONDITIONS	SYSTEM IS IN OPERATION	GREEN LED ON SWITCH IS LIT
The vehicle is moving on roads with clear lane markings.	✔	✔
The vehicle is moving on roads with no clear lane markings (e.g. frequently changing or missing lane markings).	✘	✘
The vehicle is moving above a configured speed (default parameterised speed from 60 km/h or 37 mph).	✔	✔
The vehicle is moving below the configured speed.	✘	✘

The function of the system can be hindered or disabled by the following conditions:

- dirty or damaged windscreen
- poor light conditions, such as insufficient illumination of the lane or strong glare
- poor weather conditions, such as snow, ice, heavy fog / rain
- missing, worn, faded, damaged or covered lane markings
- speed below the parameterised speed
- ignition off

The system can be disabled for a period of 10 minutes on roads with no clear lane markings to avoid false alarms. The yellow LED is lit until the automatic reset occurs.

Automatic activation of OnLane™:

- after 10 minutes since deactivation
- after the ignition is turned on again

4 Components

Scope of supply Set 1 (WABCO part number 446 069 010 0)

The OnLane™ Set 1 includes the following components:

COMPONENTS	FIGURE
1x Camera with connector cable	
1x Mounting bracket (Angle range 75-90°, windscreen inclination) 1x Mounting bracket (Angle range 60-75°, windscreen inclination)	
2x T-15 torx screws	
1x Secondary lock A	
1x Secondary lock B	
1x Bushing housing	
16x Bushing housing pins (18 AWG)	
16x Bushing housing pins (20 AWG)	
1x Publication "OnLane™ – Installation Manual"	
1x Publication "OnLane™ – Driver information"	

Scope of supply Set 2 (WABCO part number 446 069 020 0)

The OnLane™ Set 2 includes the following components: Set 2 can be purchased separately if needed.

COMPONENTS	FIGURE
1x Switch	
1x Cable harness	
2x Speaker	
1x Installation kit	

Scope of supply Set 3 (WABCO part number 446 069 910 0)

The OnLane™ Set 3 includes the following components: Set 3 can be of purchased as a maintenance replacement for mounting brackets.

COMPONENTS	FIGURE
1x Mounting bracket (Angle range 75-90°, windscreen inclination) 1x Mounting bracket (Angle range 60-75°, windscreen inclination)	

5 Installation

This chapter contains information necessary for the correct installation of the OnLane™ system.

5.1 Prerequisites for system installation

Before installing the OnLane™ system in a vehicle, you should first check for the following prerequisites:

- The OnLane™ system can be used in commercial vehicles with 12 V or 24 V power supplies.
- It is not suitable for use in the following vehicles:
  - Vehicles which are not primarily intended for use in public road traffic (e.g. military vehicles, agricultural machinery)
  - Vehicles with no windscreen
  - Open vehicles (roofless)
  - Vehicles with attachments (e.g. crane hooks, excavator buckets) which can obscure the viewing area of the camera
- The power supply via Terminal 15 must be fitted with a 5 A fuse.
- A driver's seat with vibration (not included in the WABCO delivery) can be controlled either via the CAN messages or by the camera system connected via a relay (Pin A7 - Left Seat Vibrator, Pin B7 - Right Seat Vibrator).

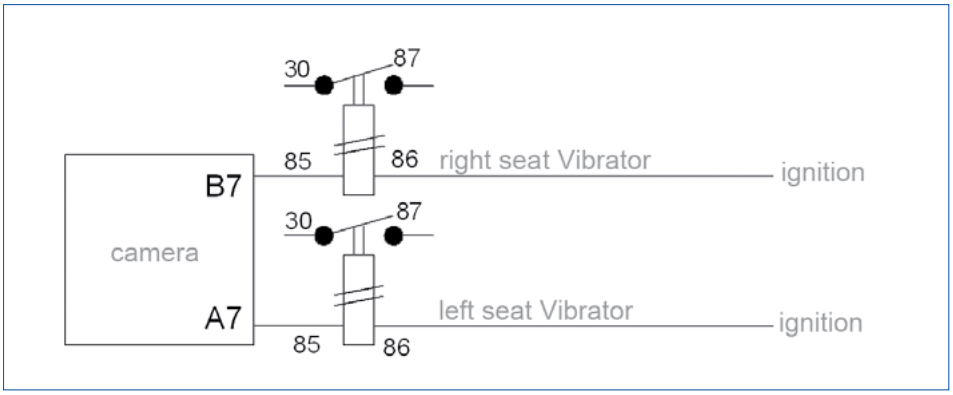

Figure 1 Electrical connection for the seat vibrator output

- Existing speakers (music system) can be used, provided that separate coils are provided solely for this system (e.g. car radio speakers with second coil windings).
- A place must be available for installing the switch.

5.2 Safety information

Before starting with the installation, read and comply with the following safety instructions.

⚠ Danger of injury by electricity, heat

- To avoid short circuits, pull out the fuse for the respective power circuit.
- Disconnect the battery if necessary.
  However, the downstream theft-protection systems may have to be reprogrammed.

⚠ Traffic safety, functionality of the safety equipment / operating elements

- Installing the components in an unsuitable location can cause injury in the event of an accident or hinder the efficacy of safety devices (e.g. airbags).
- Observe the instructions of the vehicle manufacturer relating to installation.
- Install the system so that the driver's view is not obstructed and access to all important controls is not hindered.
- During installation, ensure that the function of the airbag is not constrained, or that it is not accidentally triggered.
- Secure the components so that these cannot break loose in the event of a collision or sudden braking.

⚠ Damage to the cable

- Ensure that the cable does not become trapped or damaged.
- Plan your installation position so that the cables cannot become kinked, trapped or damaged.
- Fasten the cables and connectors so that the plug connections are not subjected to any tensile stress or lateral forces.

5.3 Preparations

The installation of the OnLane™ system is dependent on the vehicle type/ model.

– Procure the circuit diagram of the vehicle from the corresponding vehicle manufacturer.

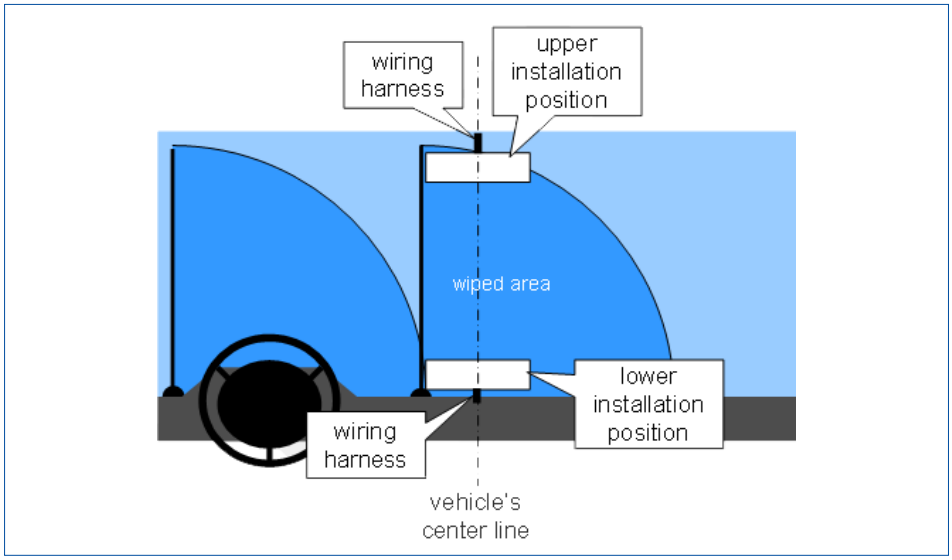

Figure 2 Possible mounting locations for the camera

– Take into consideration the following points when planning the installation of the camera:
  - The windscreen must not be subject to temperature differences.
  - The vehicle should have an ambient temperature > 15 °C.
  - The camera must be mounted at a height of 1 m - 3.2 m on the inside of the windscreen.
  - The viewing area of the camera must be within the wiping area of the windscreen wipers.
  - The camera must not restrict the driver's view.
  - The camera's installation location must allow for an appropriate channel for the cable harness.
– Prepare the cable channel by planning for appropriate access to the fuse box and for appropriate cable channels in terms of cable lengths.
– Select the mounting bracket for your vehicle type (angle of the windscreen) which provides the most vertical contact surface for the camera.

  You will find more information about the installation position in the release notes for the vehicle type.
– Mark the installation location, e.g. using sticky tape.
– Clean the windscreen at the desired mounting point using a mixture of 50 % isopropyl alcohol and 50 % water.

  ⇨ Allow the mounting surface to dry thoroughly before proceeding to the next step.

5.4 Installation

Mounting bracket

– Screw the two T-15 torx screws into the mounting bracket.
– Remove the protective foil from the adhesive surface on the mounting bracket.
– Align the bracket according to the marking.
– Press the bracket against the wind screen for at least 30 seconds.
  ⇨ The full load-bearing capacity of the mounting bracket is only achieved after 1 hour.

Camera

– Remove the protective cap from the camera.
– Ensure that the lens is free from contamination.
  Do not touch the lens.
– Insert the camera into the mounting bracket.

  If the mounting bracket is fitted in the lower section of the windscreen, install the camera so that the cable comes from the bottom side of the camera.

  If the mounting bracket is fitted to the top of the windscreen, install the camera so that the cable comes from the top side of the camera.

  The orientation of installation must be configured in the camera accordingly using the Diagnostic Software (the standard option is the bottom mount with the cable coming from the bottom side of the camera).
– Tighten the two T-15 torx screws to a torque of 2.5 +/-0.4 Nm.

Switch + cable harness

– Route the cable underneath the panelling.
– Insert the switch.

  Preferred installation position: within the driver’s field of vision
– Connect the relevant cable harness contacts to the vehicle.

  Indicator lights and the brake light switch can be configured via CAN or through direct electrical connections.

Speaker

– Install the loudspeaker such that the driver can not only hear the warning signal properly, but can also determine the direction in which he is leaving the lane.

  Preferred installation position: in the vicinity of the A-column

  Existing speakers (music system) can be used, provided that separate coils are provided solely for this system (e.g. vehicle radio speakers with second coil windings).

Electrical connector

Type: Delphi Packard P/N 15305213

MATCHING HARNESS CONNECTOR	DELPHI PACKARD P/N
housing	12110088
terminal position assurance	12047900 (terminal row A) 12047901 (terminal row B)
Pins	12146448 (for 0.8 - 1 mm² wires) 12146447 (for 0.35 - 0.6 mm² wires)

ROW A		ROW B	
Pin no.	**Signal Name**	**Pin no.**	**Signal Name**
A1	Left loudspeaker output +	B1	Left loudspeaker output -
A2	Right loudspeaker output +	B2	Right loudspeaker output -
A3	Not used	B3	Not used
A4	Input, left driving direction indicator (optional)	B4	Input, right driving direction indicator (optional)
A5	Not used	B5	Not used
A6	Not used	B6	Not used
A7	OnLane™ Deactivated/Fault indication output or Audio Silent output or left seat vibration output	B7	OnLane™ "Ready to warn" indication output or Audio Silent output or right seat vibration output
A8	Braking signal input (optional)	B8	Activate/Deactivate input switch (optional)
A9	Key 15 (ignition)	B9	Key 31 (grounding)
A10	Not used	B10	Not used
A11	Not used	B11	Not used
A12	CAN J1939 High	B12	CAN J1939 Low

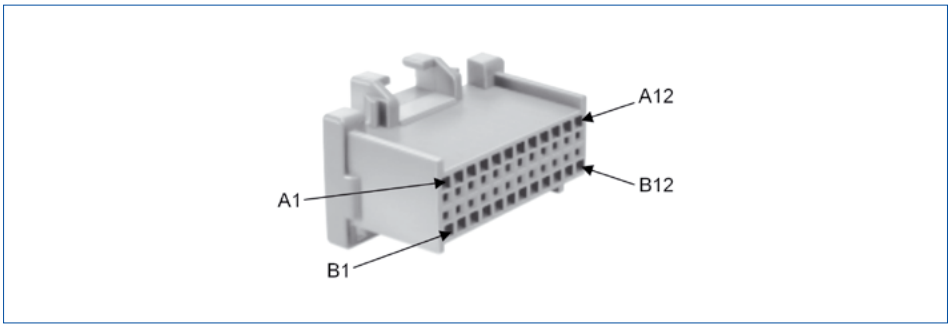

Figure 3 Mating connector for camera

6 Diagnosis

6.1 Training

Certain functions are protected in the diagnosis. These functions can be activated with a PIN2. You obtain the PIN2 after you have successfully worked through an E-Turorial.

E-Tutorial / PIN2
For further information please visit out digital learning platform:
wbt.wabco.info
Please contact your WABCO partner if you have any questions.

6.2 Hardware

– Connect the Diagnostic Interface (WABCO part number: 446 301 030 0) to the central diagnostic port on the vehicle and the diagnostic PC.

6.3 Parameter setting and calibration

Ordering OnLane™ Diagnostic Software
– Open the myWABCO website:
http://www.wabco-auto.com/en/aftermarket-services/mywabco/
Help on logging in can be obtained by pressing the *Step-by-step instructions* button. After you have successfully logged in, you can order the OnLane™ diagnostic software via myWABCO.
Please contact your WABCO partner if you have any questions.

– Open the WABCO Diagnostic Software for the OnLane™ system.
– Select the desired ECU.
– Click on *OK*.
⇨ The start window is opened.

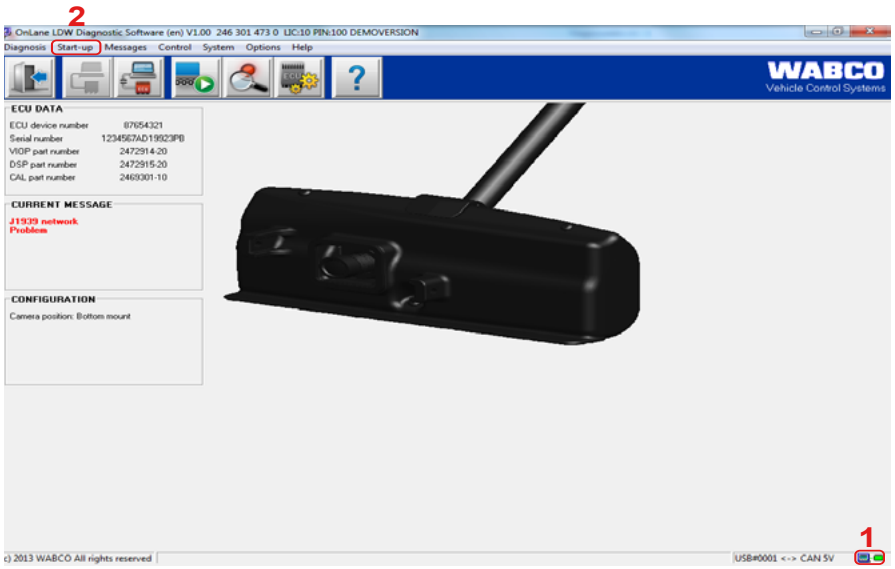

Figure 4 Start window of "OnLane LDW Diagnostic Software"

– Check the connection of the diagnostic tool:
  ⇨ LED symbol lights up green (1): Connection is established
  ⇨ LED symbol lights up red: No connection available
– Check that there is a connection from the PC to the vehicle (LED symbols on the interface are lit).
– Click on the *Start-up* tab (2).
– Click on *Start*.
  ⇨ The *Start-up* window is opened.

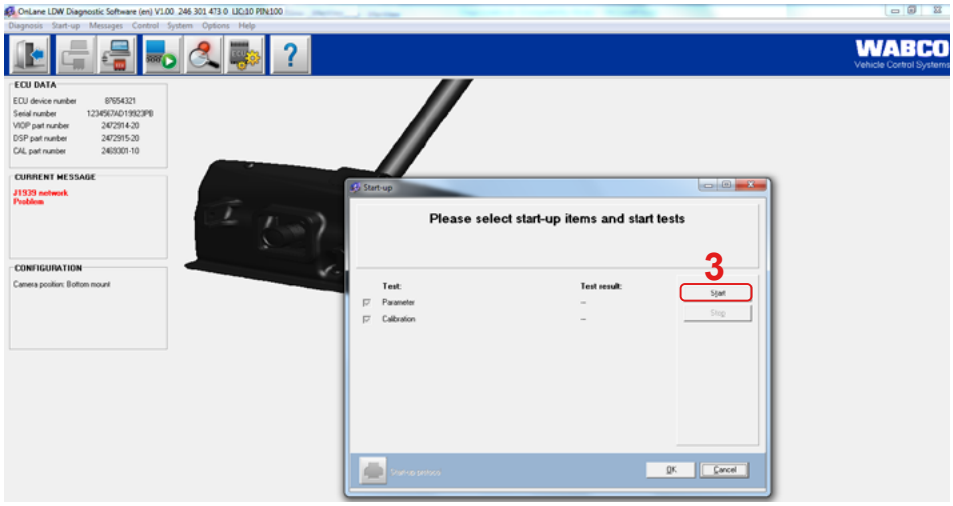

Figure 5 "Start-up" window

– Click on *Start* (3).
– Save the *.eol file.
– Click on *OK*.
  ⇨ The *Enter the protocol data* window appears.

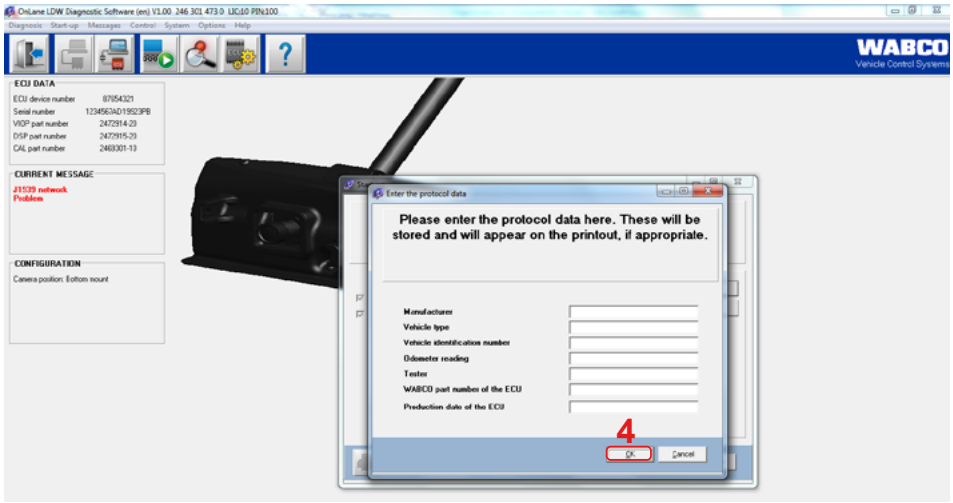

Figure 6 "Enter the protocol data" window

– Complete the data sheet *Enter the protocol data* for your vehicle.

– Click on *OK* (4).

⇨ The *Parameters* window appears.

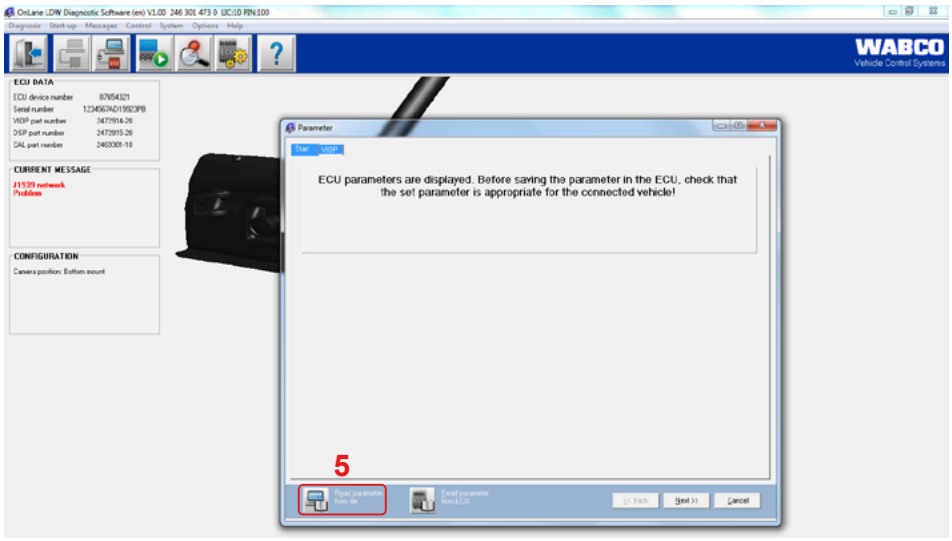

Figure 7 "Parameters" window

– Click on the button *Read parameters from file* (5) to read in the parameter file (*.st4) which WABCO has published for this vehicle type. Please contact your WABCO partner if you have any questions.

– Click the *Next* button.

– Check the parameter data.

– Click on the button *Write parameters to ECU* (6) to write the parameter data into the ECU.

⇨ The *Enter PIN / PIN2* window appears.

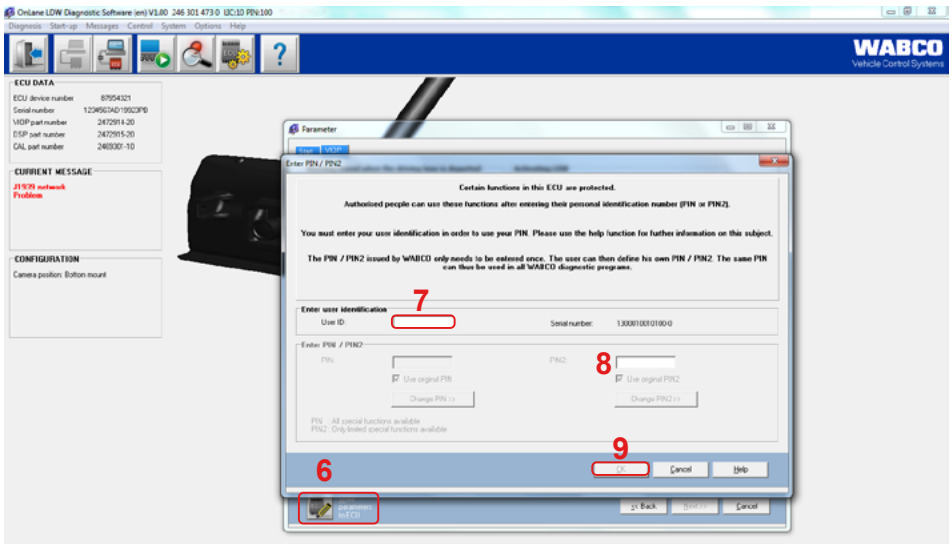

Figure 8 "Enter PIN / PIN2" window

– Enter your user ID (7) and your PIN2 (8).

– Click on *OK* (9).

⇨ The OnLane™ system will reboot after the parameter data has been transferred.

⇨ The *Calibration* window is opened.

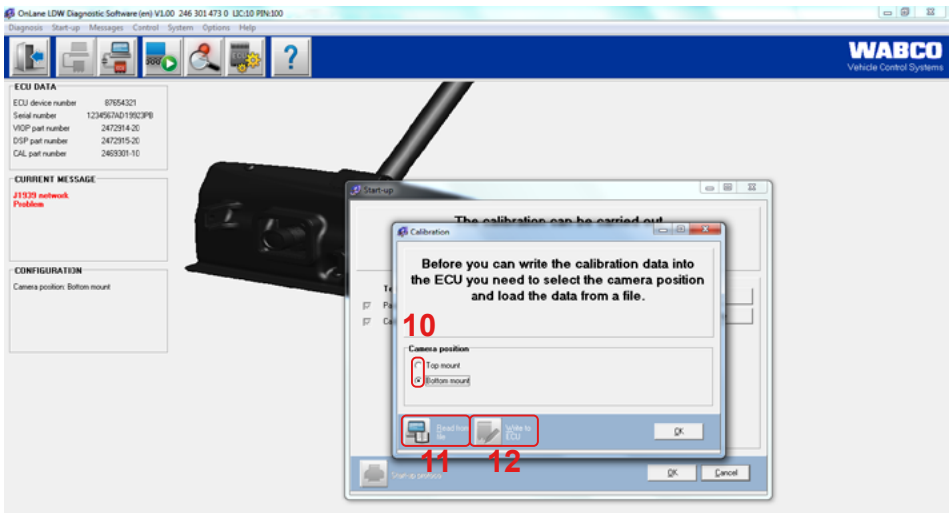

Figure 9 "Calibration" window

– Select the desired *Camera position* (**10**) for the installation.
– Click on the button *Read from file* (**11**) to read in the calibration file (*.spt) which WABCO has published for this vehicle type. Please contact your WABCO partner if you have any questions.
– Click on the *Write to ECU button* (**12**) to write the calibration data into the ECU.

⇨ The OnLane™ system will reboot after the calibration data has been successfully transferred.

⇨ The *Start-up* window is opened.

Figure 10 "Start-up" window

– Click on the *Start-up log* button (**13**) to check the results.
– Click on the *OK* button (**14**) to close the window.
– Exit the WABCO Diagnostic Software.

7 Start-up of the system

Carry out the start-up procedure if the system is newly installed in the vehicle or if repairs have been made to the system.

– To start the commissioning, switch on the ignition and wait until the start-up self-test is completed.

  ⇨ In the event of a fault in the system, the yellow LED on the switch lights up.

  Loudspeaker: By default, the start up sound is disabled. The user will not hear the audible signal on the left and the right speakers after turning on the ignition.

  LEDs at the switch: If the switch is used and configured for light signals, both the green and yellow LED will come on during start up as a self check.

8 Test drive

⚠ CAUTION	**Risk of accident when crossing lane markings without using indicators** When carrying out a test drive without using the indicators, crossing lane markings can hinder or endanger other road users. – *Test drives should wherever possible be performed on empty streets.*

– Carry out a test drive to test the OnLane™ system's signalling effect.

– Perform a short test drive during the day or when there is sufficient brightness.

– Drive on a road where it is allowed to drive faster than 60 km/h and where there are clear lane markings on both sides.

– Cross the lane markings both on the right and left without using the indicators.

  ⇨ The system should now trigger a warning either via the speaker or via the seat vibration.

9 Workshop notes

9.1 Maintenance

The WABCO OnLane™ system is maintenance-free.

9.2 Replacement

! Only use original WABCO replacement parts.

9.2.1 Replacing the mounting bracket

A new mounting bracket must always be installed if the windscreen is replaced or if the mounting bracket is damaged, ▸ Chapter "5 Installation", page 11.

You can order the mounting brackets as Set 3 ▸ Chapter "4 Components", page 9.

Following the replacement, carry out another start-up procedure of the system, ▸ Chapter "6.3 Parameter setting and calibration", page 16.

9.2.2 Replacing a camera

If diagnosis does not occur, first check the power supply to the camera. It may be necessary to replace the camera module ▸ Chapter "6.3 Parameter setting and calibration", page 16.

Following the replacement, carry out another start-up procedure of the system, ▸ Chapter "6.3 Parameter setting and calibration", page 16.

9.3 Fault codes

If a fault is present, the yellow LED is lit continuously and the green LED starts to "flash" the identified faults.

The sequence of green flashing signals is counted for reading out the fault code.

If fault code 2.3 is present for example, the system flashes two times for the first digit, then pauses for three seconds and then flashes 3 times for the second digit.

Once the system has flashed the complete fault code, the green LED goes out.

FAULT CODE	MEANING	ACTION
No code	Ready to warn	– Check the LED or Pin B7 for proper connection.
1	Dirty window	– Clean the windscreen and restart the system.
2	OnLane™ malfunction	– Check the system.
3	ECU overtemperature	– Check the system.
3.1	OnLane-switching input still Low	– Check pin A4 on the connector and the end of harness for proper connection.
3.2	Left direction indicator still High	– Check pin B8 on the connector and the end of harness for proper connection.

FAULT CODE	MEANING	ACTION
3.3	Right direction indicator still High	– Check pin B4 on the connector and the end of harness for proper connection.
3.4	Brake input still High	– Check pin A8 for proper connection in the connector and at the end of harness.
7.1	J1939 malfunction	– Check whether pins A12 and B12 are properly connected on the connector and the end of the cable harness.

9.4 Technical data

COMPONENT	DESCRIPTION
Camera	■ Operating temperature: -40 °C to +85 °C ■ Operating voltage range: 9 to 32 V ■ Current consumption: 0,5 A at 24 V ■ Weight: 390 g ■ Material: Aluminium ■ Lane markings which can be recognised: dashed, solid, double, dotted lines ■ Lane coverage: approx. 60 m in daylight; approx. 40 m at night when lit ■ Operating speed range: set speed (default 60 km/h) - 250 km/h
Speaker (optional)	■ Impedance: 4 to 8 Ω

9.5 Disposal / Recycling

- Do not dispose of electronic devices, batteries, or accumulators together with household refuse. These must instead be handed over to a designated collection point.
- Observe the national and regional regulations.
- Simply contact your WABCO partner if you have any questions.

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