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**Edition 01**

Version 1 (05/2017)

This publication is not subject to any update service. You will find the current version on the internet at http://www.wabco.info/i/678
1 General information

Purpose of this document

This document relates to a CAN data gateway that is designed to transmit information from a source CAN bus to a target CAN bus. In this respect it is ensured that devices connected to the target CAN bus do not interfere with the source CAN bus. Data can only flow from the source CAN bus to the target CAN bus.

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Any brand names, even if not indicated as such, are subject to the rules of the trademark and labelling rights.

Symbols used

<table>
<thead>
<tr>
<th>WARNING</th>
<th>Indicates a potentially hazardous situation Failure to observe the safety instruction can result in severe injuries or death.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Follow the instructions in this warning to avoid injury or death.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Indicates a potentially hazardous situation Failure to observe the safety instruction can result in minor or moderately severe injuries.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Follow the instructions in this warning to avoid any injuries.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>Specifies possible material damage Not observing the safety instruction can lead to material damage.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Follow the instructions in this warning to avoid any material damage.</td>
</tr>
</tbody>
</table>

Important information, instructions and/or tips that you must always observe.

Reference to information on the internet
General information

- 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 search field Product number.

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.

<table>
<thead>
<tr>
<th>DOCUMENT TITLE</th>
<th>DOCUMENT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Instructions WABCO</td>
<td>815 XX0 239 3</td>
</tr>
<tr>
<td>Multifunctional CAN Gateway</td>
<td></td>
</tr>
</tbody>
</table>

*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

Choose genuine WABCO parts

Genuine WABCO parts are made of high quality materials and are rigorously tested before they leave our factories. You also have the assurance that the quality of every WABCO product is supported by an outstanding WABCO customer service network.

As a leading supplier to the industry, WABCO collaborates with the world’s leading original equipment manufacturers, and has the experience and capacities required to also satisfy the most stringent production standards. The quality of every genuine WABCO part is supported by:

- Tooling made for serial production
- Regular sub-supplier audits
- Exhaustive end-of-line tests
- Quality standards < 50 PPM

A genuine WABCO part is as unique as your fingerprint. Accept no substitutes.

Installing replica parts can cost lives – genuine WABCO parts protect your business.
## WABCO additional services

The package you will get with a genuine WABCO part:

- 24-month product warranty
- Overnight delivery
- Technical support from WABCO
- Professional training courses from the WABCO Academy
- Access to diagnostics tools and support from the WABCO Service Partner network
- Straightforward claims handling
- Confidence that the vehicle manufacturer’s rigorous quality standards are met

## WABCO Service Partner

WABCO Service Partners – the network you can rely on. You can access 2000 high quality workshops with more than 6000 specialist mechanics, all trained to WABCO’s exacting standards and equipped with our most up-to-the-minute systems diagnostic and support technology.

## Your direct contact to WABCO

In addition to our online services, trained members of staff are there to help you at our WABCO Service Partners to directly answer any technical or business-related questions you may have.

Contact us if you need assistance:

- Find the right product
- Diagnosis support
- Training
- System support
- Order management

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You can find your WABCO partner here:  
Before starting with the installation, read and comply with the following safety instructions.

**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 safety, reliability and performance of their products and systems if all the information in this publication is adhered to.
- Always abide by the vehicle manufacturer's specifications and instructions.
- 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 hand 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.
  - Disconnect the battery from the vehicle for the duration of the installation to ensure that it is at zero potential.
The WABCO Multifunctional CAN Gateway (MCG) is a CAN data gateway that is designed to transmit information from a source CAN bus to a target CAN bus. For this purpose the MCG is configured so that when it is connected to the source bus, it does not cause interferences on the source bus or transmit signals from the target bus to the source bus.

Prior to installation

The present instructions will guide your through the installation procedure for the WABCO Multifunctional CAN Gateway electronic control unit. The instructions communicate the required information pertaining to prerequisites, components and installation requirements.

Complete observance of the installation instructions is a precondition for fault-free operation of the MCG. The devices and cables supplied by WABCO must be used for installation.

Connection to the vehicle bus must be implemented by a trained vehicle technician / mechatronic specialist.

Connections - Disclaimer

WABCO or WABCO TRANSICS are not liable for damage and faults as a result of an incorrect installation. The fitter is responsible for the correct choice of components, execution of the installation and connection to the data busses. Basic knowledge of CAN data busses is required.

WABCO offers training courses to support the technicians of companies that install the system.

The figures and specific data, particularly of vendor parts and cables have been carefully checked and were considered correct at the time these instructions were prepared. WABCO cannot be held liable for vendor errors.
Components

4 Components

The components required for installation are listed below. The set consists of the Gateway ECU itself and three connecting cables to be used for connection to the vehicle network and third party devices. The connecting cables are included in the scope of supply.

The data cable (see chapter "4.2 Data cable" on page 10) is used to link the vehicle's source CAN bus, the target device and the MCG.

The power supply cable (see chapter "4.1 Supply cable" on page 10) is used to supply the MCG with permanent voltage, ignition signal and vehicle ground. It must be attached to the Gateway ECU and the vehicle's supply rail.

The connecting cable to the source CAN bus is installed between the vehicle's source CAN bus and the data cable (see reference Installation).

Below is a list of that part of the cabling which is independent of the vehicle.

<table>
<thead>
<tr>
<th>PRODUCT NUMBER</th>
<th>FIGURE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>446 270 060 0</td>
<td><img src="image" alt="Image of MCG" /></td>
<td>WABCO Multifunctional CAN Gateway (MCG) 192.5 x 119.5 x 32.75 mm (WxHxD) White connection: X1 Yellow connection: X2 (not used) Black connection: X3</td>
</tr>
<tr>
<td>446 270 061 0</td>
<td><img src="image" alt="Image of supply cable" /></td>
<td>Supply cable Connectors: Left: MCG X1 (white) Right: Open line ends for connection to the vehicle</td>
</tr>
<tr>
<td>446 270 061 0</td>
<td><img src="image" alt="Image of data cable" /></td>
<td>Data cable Connectors: Left: MCG X3 (black) Centre: Connection to the connecting cable Right: Target device</td>
</tr>
<tr>
<td>446 270 061 0</td>
<td><img src="image" alt="Image of connecting cable" /></td>
<td>Connecting cable to the source CAN bus Connectors: Left: Open line ends for connection to the vehicle Right: Connection to the data cable</td>
</tr>
</tbody>
</table>
4.1 Supply cable

The supply cable has a connector at one end and three exposed cores at the other end. The connector is used to connect the cable to the MCG via the X1 connecting socket on the device. The three cores must be connected to the vehicle network, with respect to which the following must be noted:

<table>
<thead>
<tr>
<th>CORE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red core</td>
<td>Steady positive voltage</td>
</tr>
<tr>
<td>Black core</td>
<td>Vehicle mass</td>
</tr>
<tr>
<td>Green core</td>
<td>Ignition plus</td>
</tr>
</tbody>
</table>

4.2 Data cable

The data cable has three connectors. The 54-pole connector is used for the connection to the MCG. The X3 socket is provided on the device for this purpose. After connecting the connector, the connector lever must be flipped to arrest the connector correctly. The 6-pole connector is used for the connection to the source CAN bus (vehicle bus). The 4-pole connector is provided for the connection to the target device.

4.3 Connecting cable to the source CAN bus

The connecting cable contains two cores and is used as a connecting piece between the data cable and the target CAN bus. The open line ends must be connected to the vehicle, the connector at the other end is connected to the 6-pole connector of the data cable.
5 Installation

This chapter contains information necessary for the correct installation of the Multifunctional CAN Gateway.

5.1 Installation location

The electronic control unit is only approved for installation within the driver’s cabin. The ambient temperature at the installation location must not lie outside the temperature range of -40 °C … +80 °C during operation. In addition, the device is categorised by IP30 degree of protection in accordance with IEC529. The installation environment must be selected accordingly.

5.2 Prerequisites for system installation

- Before installing the Multifunctional CAN Gateway in a vehicle, you should first check for the following prerequisites:

In the interior, the ECU must be fastened by means of the four retaining elements (see red markings in the diagram below).

![Diagram showing the marking of screw connection eyes on the MCG](image-url)
It must be ensured that the installation position does not deviate from the positions shown in the diagram.

The ECU must be installed in the driver’s cabin behind a standard cladding. The preferred installation location is underneath the instrument panel cover on the passenger side of the vehicle.

If it is not possible to find a suitable installation location, the unit must not be installed.

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

### 5.3 Preparations

The WABCO Multifunctional CAN Gateway (MCG) is a CAN data gateway that transmits data from the source data bus (e.g. vehicle data bus) to the target data bus without interferences.

The installation must be carried out by a trained vehicle electronics/mechatronics technician.

- Prior to installation, check if the source bus to be picked up complies with the requirements in accordance with SAE J1939 standards with respect to:
  - maximum number of subscribers,
  - message format according to ISO 11898-2 and termination.

That the source bus is fault-free, for example, must be determined by a measurement using a CAN reading device. If this is not ensured, the gateway must not be installed.
Installation

– Verify that the requirements according to the SAE J1939 standard are still met after installing the gateway (maximum number of subscribers, maximum bus length, correct termination, …).

There is no additional or subsequent termination of the source data bus by means of the Gateway ECU. If this is not ensured, the gateway must not be installed.

– Beforehand, make sure that the source bus operates with the correct data transmission rate and that this matches the MCG’s data transmission rate.

If this is not the case, the gateway must not be installed.

– Check if the vehicle can provide an installation location in accordance with see chapter "5.1 Installation location" on page 11.

If a corresponding installation location is not available, the unit must not be installed.

– Check if additional specifications in relation to the installation of the ECU exist from the vehicle manufacturer.

It is essential to comply with these during installation.

5.4 Testing the vehicle data bus

The MCG can only be installed on a CAN data bus that is based on the standardised SAE J1939 protocol.

– Test prior to installation whether the CAN source bus transmits data according to the SAE J1939 protocol.

5.5 Checking the data transmission rate and selection of the ECU variant

Two different parameter versions of the MCG are provided for the connection to a CAN data bus with different transmission rates. The table below shows possible combinations.

<table>
<thead>
<tr>
<th>SOURCE BUS</th>
<th>TARGET BUS</th>
<th>FIRMWARE ID</th>
<th>PLANT DATA SET ID</th>
<th>SERVICE AREA DATA SET ID</th>
<th>VARIANT NAME</th>
<th>VARIANT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 kBit/s</td>
<td>250 kBit/s</td>
<td>GATW_SW_1.1</td>
<td>WABCO_TRANSICS</td>
<td>FULL_B_to_C_v1</td>
<td>CAN Gateway Transics</td>
<td>446 270 060 0</td>
</tr>
<tr>
<td>500 kBit/s</td>
<td>500 kBit/s</td>
<td>GATW_SW_1.1</td>
<td>WABCO_TRANSICS</td>
<td>FULL_B_to_C_v1</td>
<td>CAN Gateway</td>
<td>446 270 061 0</td>
</tr>
</tbody>
</table>

As a next step it is therefore necessary to check which data transmission rate is used by the source bus to which the MCG will be connected. The corresponding MCG variant must be used.

5.6 Safety information

⚠️ Danger of injury by electricity, heat

- To avoid short circuits, pull out the fuse for the respective power circuit.
Installation

- 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.

5.7 Connecting the device to the vehicle

Figure 3 shows the Gateway ECU with correctly connected connecting cables. The vehicle network with supply voltage pick-up, source CAN bus and the third party device with the target CAN bus are not shown.

Figure 4 shows a diagram of the cabling.
Figure 4  Schematic overview of the cabling for connecting the Gateway ECU
5.8 Installation test

The following test plan must be carried out after every installation. If even a single test requirement is not passed, the vehicle must not be put into operation and it is necessary to return the vehicle to its original state.

After the Gateway has been installed, the fitter must carry out the following test steps to ensure operation without interferences and thus a correct installation: The test is performed with the vehicle’s installation turned on.

- Make sure that the vehicle system does not report any active faults (reading the instrument panels and the control unit diagnosis).
- Ensure by means of measurement with a CAN reading device that the source bus is fault-free after connecting it to the MCG.

The results of this measurement must be compared to the results of the measurement prior to installing the Gateway (see chapter “5 Installation” on page 11) and must not differ.

- Connect a reading device to the target bus to ensure that the desired vehicle data is transmitted from the source bus to the target bus.

If all test items can be confirmed, the MCG was correctly installed and is now ready for use.
## 6 Problems and corrective measures

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>REMEDIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target device does not receive any or incorrect CAN data</td>
<td>– Check the power supply of the MCG.</td>
</tr>
<tr>
<td>Target device does not receive any or incorrect CAN data</td>
<td>– Check if the CAN cables (CAN High and CAN Low) are correctly connected to the source CAN bus.</td>
</tr>
<tr>
<td></td>
<td>– Check if the CAN cables (CAN High and CAN Low) are correctly connected to the target CAN bus.</td>
</tr>
<tr>
<td>Target device does not receive any or incorrect CAN data</td>
<td>– Check the correct termination (terminating resistor) of the target CAN bus.</td>
</tr>
<tr>
<td>Target device does not receive any or incorrect CAN data</td>
<td>– Check if the MCG version with the correct baud rate was installed in the vehicle.</td>
</tr>
<tr>
<td>Vehicle behaves unusually after installing the MCG</td>
<td>– Remove the MCG again and contact a workshop.</td>
</tr>
<tr>
<td>Vehicle indicates fault messages</td>
<td>– Remove the MCG again and contact a workshop.</td>
</tr>
</tbody>
</table>
7 Workshop notes

7.1 Maintenance

WABCO Multifunctional CAN Gateway is maintenance-free.

7.2 Disposal / Recycling

- The system components are electronic scrap and must not be disposed of together with domestic waste. When disposing components, observe all the laws and regulations applicable in your country.

- This applies in particular to sensors that contain lithium batteries. These are solidly potted inside the housing and can not be replaced. Once they have reached the end of their life, dispose of the sensors while observing all the laws and regulations that apply in your country.

- WABCO strives to protect the environment. As with other old devices, all components can be returned to WABCO. Speak to your WABCO sales partner about this.
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