Operating and Installation Instruction

BrakePadMonitor

BPW-EA-BPM 37631901e

we think transport

1 Introduction to the BrakePadMonitor

Contents

1.1 Introduction

1.1 Introduction

The BrakePadMonitor system is used to capture data about pad wear, clearance and caliper articulation of BPW disc brakes.

Up to six brake wear sensors can be operated on a single BrakePadMonitor hub. The sensors determine the wear adjustment-related travel of the brake caliper on the fixed bearing side of the brake caliper. The data is centrally captured by the BrakePadMonitor hub and sent to the master control unit (TC Trailer Gateway). This unit subsequently ensures display capability for a telematics portal or an app used on mobile devices.

Valid: 01.05.2019

Current versions and additional information can be found online at www.bpw.de.

1.2 Safety information

To avoid personal injury or material damage, please observe the following safety information!

The BrakePadMonitor is an information system. It does not exempt vehicle operators from their duty to undertake legally required vehicle inspections.

Maintenance work on commercial vehicles
Observe the valid safety regulations for repair and maintenance work on commercial vehicles, in particular the safety precautions for jacking and securing the vehicle.

Proper installation
It is strongly recommended that the installation be carried out by a specialist workshop. Improper installation may cause damage to the TC Trailer Gateway units and/or the vehicle. Please also observe the instructions of the vehicle manufacturer.
Before starting on the commissioning of the vehicle, make sure that the entire braking system is in full working order.

Working on compressed air systems
Before and during work on compressed air systems, and in their environment, the relevant regulations and hazard warnings must be observed.

Risk of injury
Improper installation can render essential safety equipment ineffective and result in traffic accidents.

Damage to mountings/materials/insulation
Please note that drilling and improper attachment may cause damage to system components and the vehicle. Make sure there is sufficient space around the installed components. Cables must not be under tension, crimped or chafed. Damaged insulation can result in damage to equipment.
Attention: only use stainless steel mounting screws!

Damage caused by voltage reversal or short circuits
Always disconnect the battery before commencing work. Improper connections or short circuits may cause serious damage to system components. Before disconnecting the battery, obtain information as to whether any problems may occur during reconnection.

Damage caused by incorrect or unsuitable accessories or spare parts
Use only original parts and service kits from BPW Bergische Achsen or the vehicle manufacturer. Use only the recommended tools, as described in the BPW instructions.

Influence on on-board electronics
The system components are designed specifically for application in vehicles and therefore do not transmit any potentially disruptive electronic signals. However, improper installation can influence the on-board electronics. Please observe the instructions of the vehicle manufacturer.

Further information
- Always use a high-impedance multifunction meter
- Wear suitable protective clothing and remove all rings or necklaces before commencing the installation
- If possible, choose a dry, well-lit and well-ventilated workplace for the installation
- Make sure to comply with any regional or national regulations
- When using mounting screws, ensure correct material combinations in order to avoid contact corrosion

1 Introduction to the BrakePadMonitor

1.3 General information

1.3 General information

1.3.1 Field of use

The BrakePadMonitor is desigend to continously measure the brake pad wear of BPW ECO Disc brakes. The system is suitable for both equipping and retrofitting vehicles.

1.3.2 Notes on use

- The BrakePadMonitor should only be operated in the permitted input voltage range of 9 - 30 V.
- To prevent damage due to water penetration, seal unused cable ends with suitable waterproof (IP67) coverings.
- In the case of initial installation of the system or after replacement of the control unit, new brake pads must be used. Alternatively, used brake pads can be measured and their wear values configured via the Service portal.
- Incorrect initialisation, tampering or very large differences in the wear of the inner and outer brake pads can adversely impact the accuracy of the display.

1.3.3 Initial operation

Before installing the components, the vehicle must be disconnected from the power supply. The vehicle should be reconnected to the power supply only after all the components have been installed.

Initialisation of wear values is carried out after a few braking actions in the course of driving. Only then correct wear values will be displayed in the app or on the portal.

Prior to initial operation, ensure that all cables are correctly routed and connected to the control unit. Unused plugs must be sealed using appropriate caps. The device is turned on by connecting it to the power supply.

1.3.4 Cable routing

All cables must be routed securely and protected against vibrations. They must not be routed instead of laid over sharp edges and must be protected against mechanical damage. A minimum bend radius of 80 mm must be kept during routing. Appropriate watertight dummy plugs (BPW No. 02.3713.19.00) must be fitted to all unused plugs. All plugs are from the product series TE AMP Superseal 1.5. or HDSCS.

1.3.5 Approvals

E1 The BrakePadMonitor has E1 approval and is authorised for use in the automotive sector.

1.3.6 Disposal instructions

When disposing of electronic components, in particular concerning products with integrated batteries, make sure to comply with regional regulations or send the products back to idem telematics.

1.3.7 Warranty information

Warranty

In accordance with statutory regulations, BPW assumes the warranty for the products delivered.
This does not include defects and damage caused by improper handling, installation or operating conditions on the part of the customer In addition, the General Terms and Conditions of BPW Bergische Achsen Kommanditgesellschaft are applicable.

1.4 Components

Wear sensor and O-ring (Figure 1, BPW No. 02.3317.49.00 and 02.5679.97.40)

The wear sensor 02.3317.49.00 is intended for installation on the fixed bearing side of BPW disc brake callipers. In addition to the sensor, a sealing ring 02.5679.97.40 is required. This must be affixed to the wear sensor before mounting. The wear sensor enables continuous measurement of the brake pad wear, clearance, and calliper articulation. The sensor's voltage supply and signal evaluation are ensured via the control unit (BPW No.: 02.1601.00.62). In addition to the sensor, a sealing ring 02.5679.97.40 is required. This must be affixed to the wear sensor before mounting.

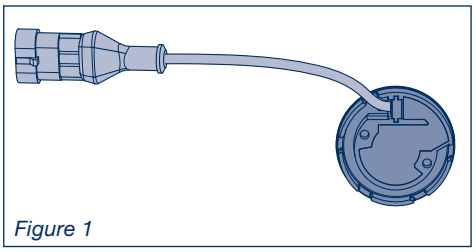


Figure 1

Control unit (Figure 2, BPW No. 02.1601.00.62)
Control unit 2 (BPW No. 02.1601.00.67)

The main control unit 02.1601.00.62 (control unit 1) establishes the connection with the master control units (e.g. TC Gateway). The individual sensor values are used to process and relay data.

If the shown installation arrangement and cable routing are observed, all other settings (wheel allocation, number of axles, etc.) will be automatically made by the main control unit following installation. In addition to the main control unit, a further control unit (control unit 2) is required for installation of 4-6 axle vehicles.

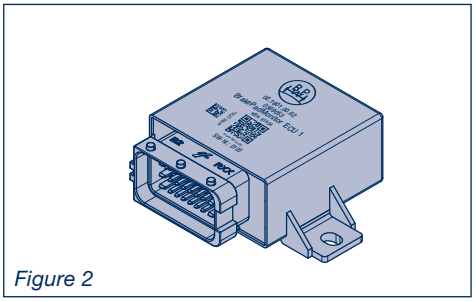


Figure 2

Y-cable (Figure 3, BPW No. 02.1819.68.00)

The Y-cable is used to incorporate the control unit into the CAN bus of the master control unit (TC Gateway). The Y-cable makes it possible to expand the CAN bus with other control units at any time.

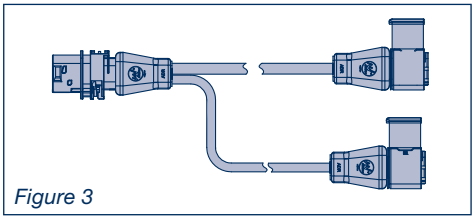


Figure 3

Main distribution cable (Figure 4, BPW No. 02.1833.06.84)

The main distribution cable is used to establish a connection with the CAN bus and the power supply of the master control unit (grey 7-pin HDSCS plug). Besides, the axle distribution cables for the right and left sides of the vehicle are connected to the two black 7-pin HDSCS plugs.

The axle distribution cable for the left vehicle side is always connected at the port that is marked with a little yellow flag.

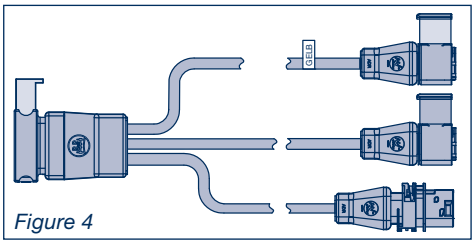


Figure 4

Axle distribution cable (Figure 5, BPW No. 02.1833.06.85)

The axle distribution cable connects the individual sensors to the main distribution cable and thus to the control unit. It is to be routed in the vehicle frame. The wheel end connections are to be routed to the sensor such that they are protected against damage (e.g. along the air hoses of the brakes).

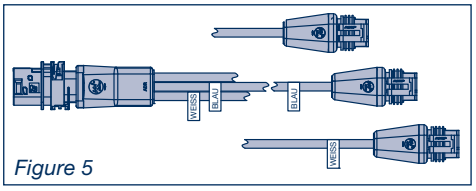


Figure 5

Dummy plug (Figure 6, BPW No. 02.3713.19.00)

Dummy plugs are used on vehicles with less than three axles. The first axle(s) in the direction of travel must always be equipped with sensors. That is to say that in two-axle vehicles, the wheel end connections of axle 3 are outfitted with dummy plugs, and the wheel end connections of axles 2 and 3 in single-axle vehicles. Dummy plugs are used according to axle.

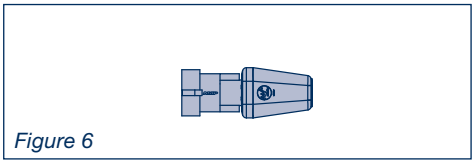


Figure 6

Termination cap (Figure 7, BPW No. 02.1819.69.00)

The termination cap is the end point of the CAN bus. It is fitted to the unused end of a Y-cable, and is essential to ensure proper functioning of the CAN bus.

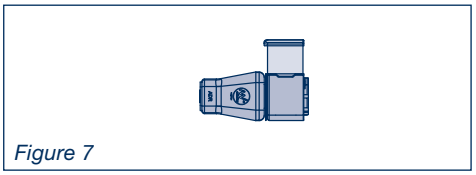
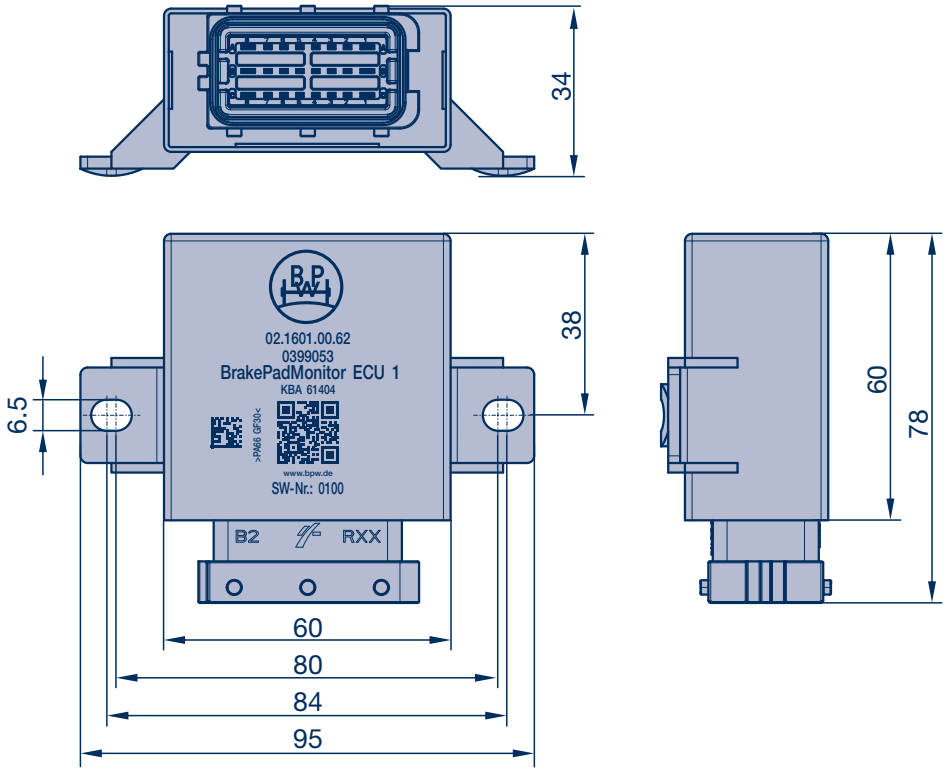


Figure 7

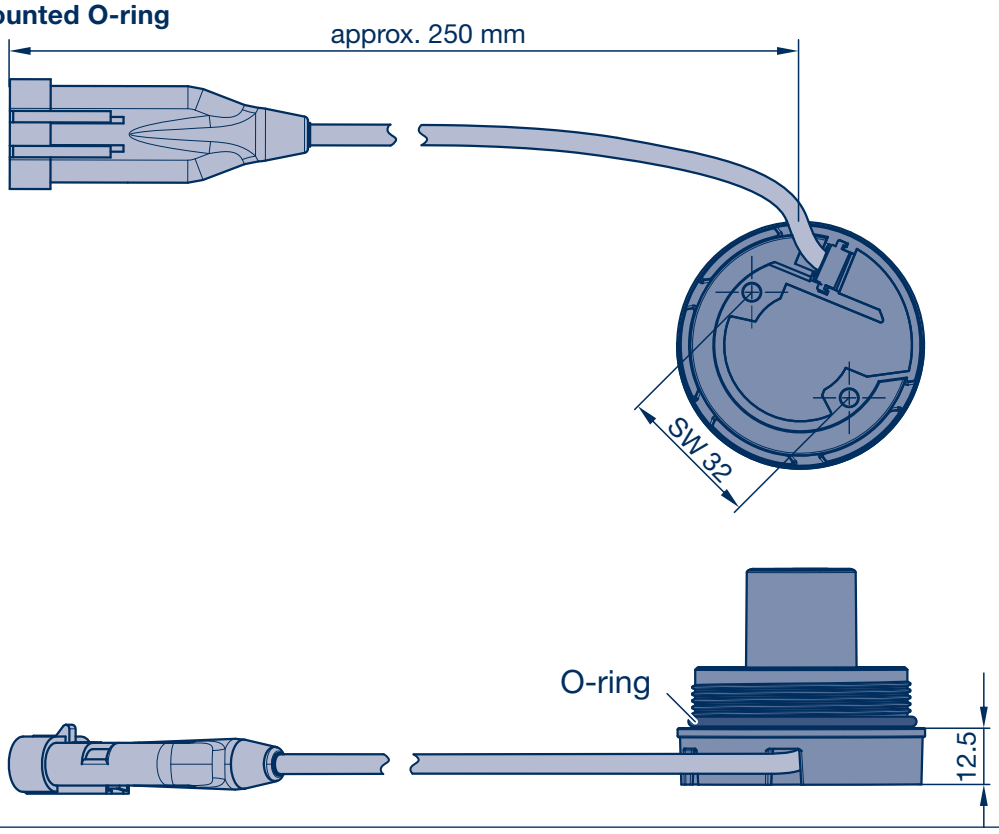
1 Introduction to the BrakePadMonitor

1.5 Dimensions

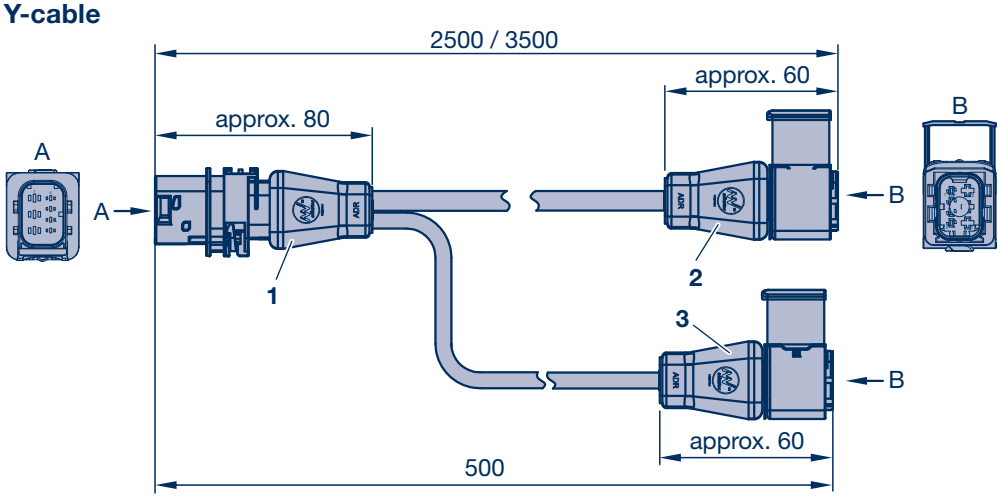
BPM control unit and BPM control unit 2.



Wear sensor with mounted O-ring



Y-cable

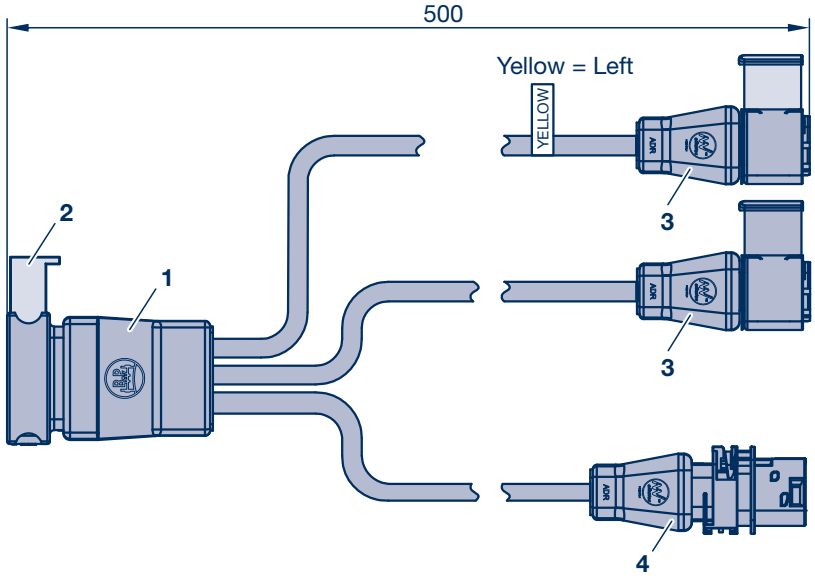


1 Male plug, 7-pin

2 Female plug, 7-pin

3 Female plug, 7-pin, B-coded, grey

Main distribution cable



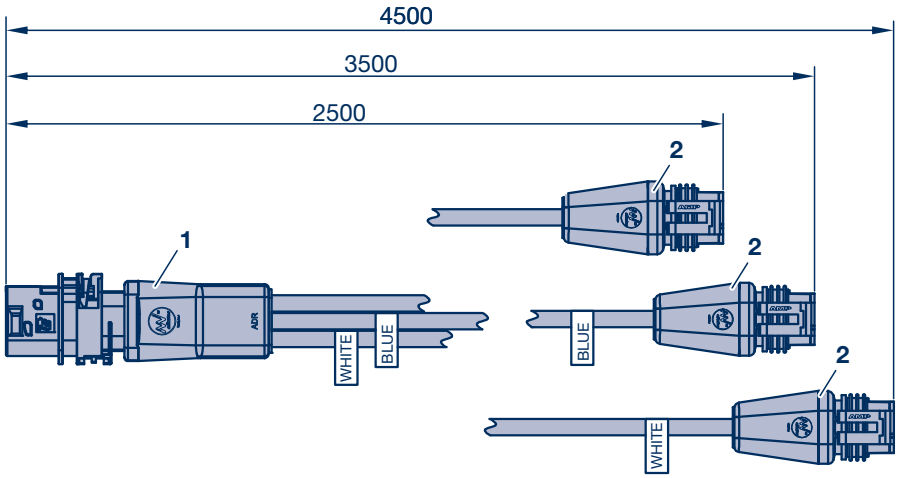
1 Female plug, 24-pin

2 Locking slide

3 Female plug, 7-pin, A-coded

4 Male plug, 7-pin, B-coded, grey

Axle distribution cable



1 Male plug, 7-pin, plug shell, A-coded

2 Female plug, 3-pin, SuperSeal

2 Installing the BrakePadMonitor

2.1 Installing the wear sensor on the ECO Disc brake

[1] Use the adapter (BPW No. 02.0130.47.10 or 02.0130.49.10, SW 14) to unscrew the sealing cap (1) of the fixed bearing on the brake caliper.

[2] Thoroughly clean the bore and contact surface of the inner guide pin (2), as well as the contact surface of the sealing cap.

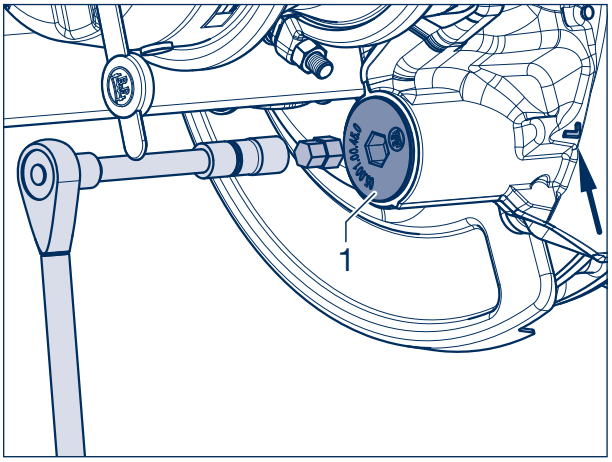


Figure 1

[3] Slide on the new O-ring until it is in contact with the wear sensor.

[4] Screw the preassembled wear sensor using a face spanner (SW 32) into the brake calliper and tighten to a torque of 15 Nm.

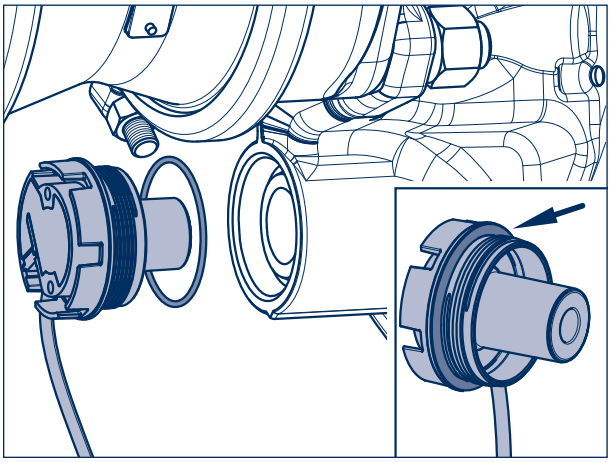


Figure 2

[5] Route the cable with plug and, if necessary, secure with a cable tie to the air hoses of the brake cylinders.

The cable outlet at the fixed bearing must be kept as far away from the wheel and the rim as possible.

Attention!
The cable must be mounted in such a way as to exclude contact with the wheel and the rim.

When mounting the sensor cable, consideration must be given to any travel of the brake caliper (i.e. allow for sufficient cable length).

The cable mounting and routing must by no means restrict the freedom of movement of the brake caliper.

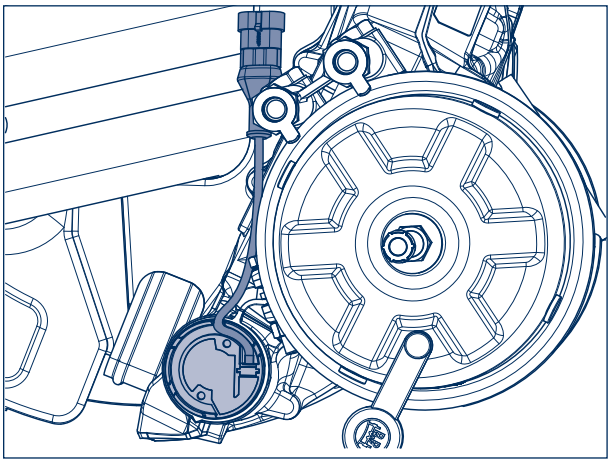


Figure 3

[6] After the wear sensor has been installed, a minimum of 30 mm of free space must be available for the travel of the brake caliper. To check this, measure the distance between the trailing arm and the wear sensor, for example.

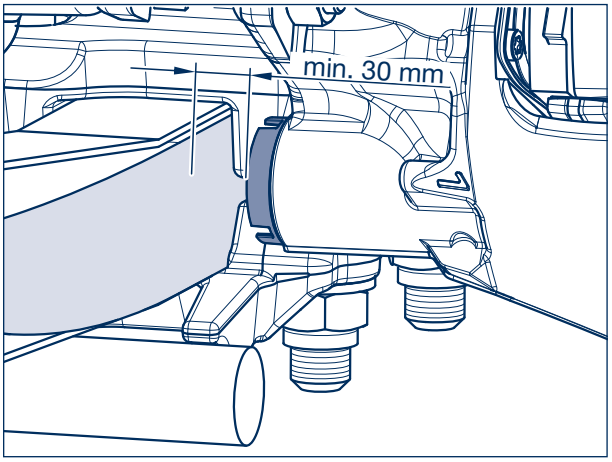


Figure 4

2 Installing the BrakePadMonitor

2.2 Installing the control unit on the vehicle frame

2.2.1 Requirements

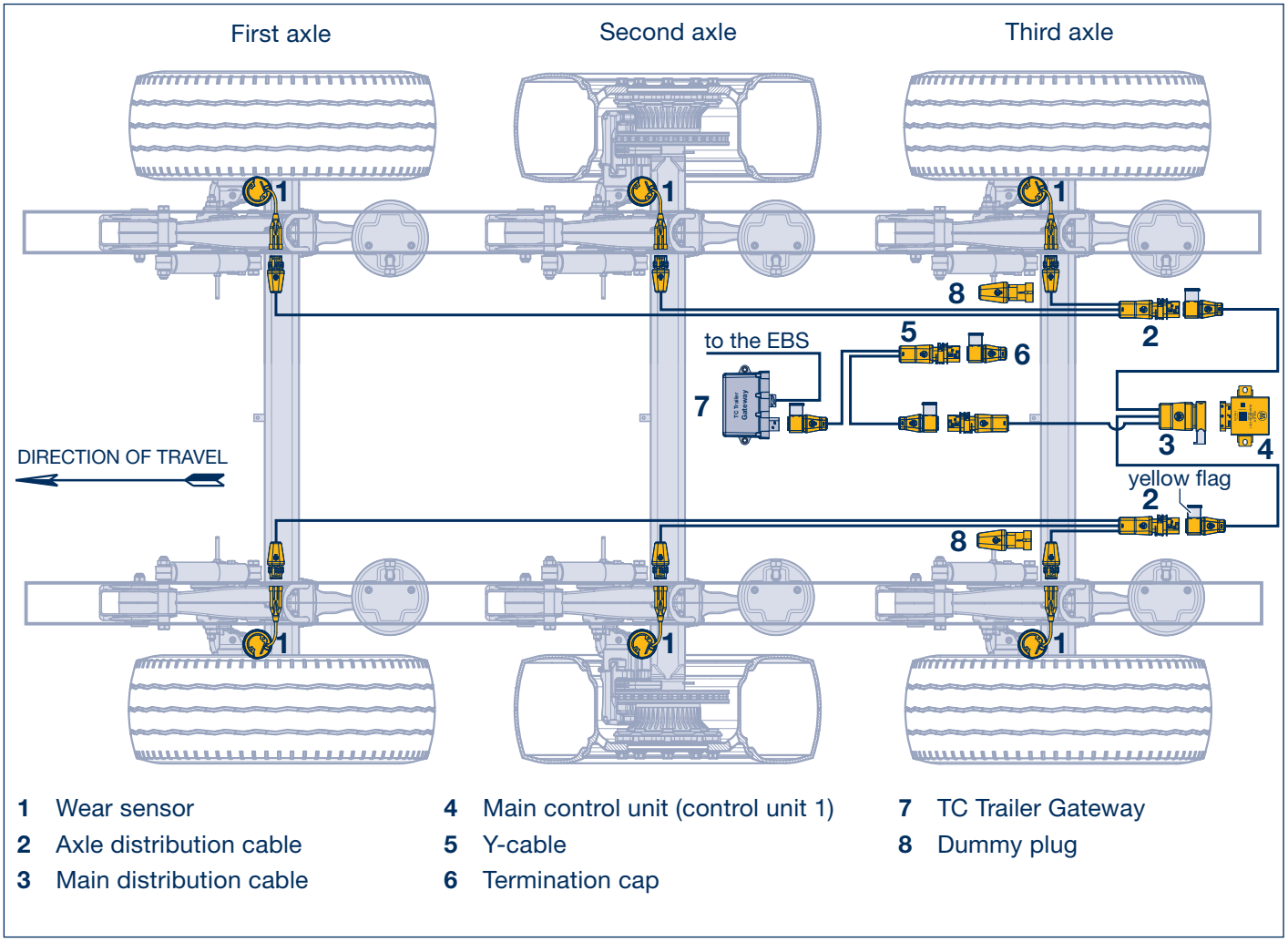
Observe the valid safety regulations for repair and maintenance work on commercial vehicles. Before starting the installation, ensure that you have all the necessary components and cables. Only use original or BPW-approved components. Both power and data are supplied via the TC Trailer Gateway.

2.2.2 Choice of installation location

When choosing the optimal installation site, the following conditions must be considered:

- It is recommended that the control unit is installed behind the unit on vehicles with up to three axles (Figure 1).
- Install the control unit at a place with minimal probability of mechanical damage, stone chips and spray.
- The control unit cable can be installed with the 24pin connector facing forward or preferably downwards.
- Observe and make allowance for existing cable lengths.
- The control unit should be installed in an access-protected area.
- Make sure that the assembly surface is flat and clean.
- Avoid heat sources in the immediate vicinity of the control unit (e.g. heater fans, heating, exhaust, etc.).
- The wheel ends will automatically be allocated correctly if the sensors on the first axle (in the direction of travel) are connected to the longest cable ends on the axle distribution cable, the sensors on the second axle to the second longest cable ends, and the sensors on the third axle to the shortest cable ends.
- If the control unit is to be installed before the suspension unit, this configuration can be set via the Internet portal, or via a dummy plug configuration.
- For vehicle installations deviating from the three-axle installation or six-axle installation (see attached sheet at www.bpw.de) shown here, please contact BPW’s customer service department. You can contact our service hotline on +49 (0) 2262 78-0.

Cable routing for the BrakePadMonitor 2.3



1 Wear sensor
2 Axle distribution cable
3 Main distribution cable
4 Main control unit (control unit 1)
5 Y-cable
6 Termination cap
7 TC Trailer Gateway
8 Dummy plug

Figure 1

[1] Mount the wear sensors (1) on the brake calipers. Route and mount the sensor cables (see pages 8 - 9).

[2] Place the axle distribution cables (2) in the frame and connect to the wear sensors. Always begin cable routing with the longest cable for axle 1 (Figure 1 on page 11), then continue towards axle 3.

[3] Free cable plugs on the axle distribution cables must be fitted with dummy plugs (8).

[4] Connect the main distribution cable (3) to the two axle distribution cables. Connect the axle distribution cable on the left side of the vehicle to the cable end of the main distribution cable indicated with the yellow flag.

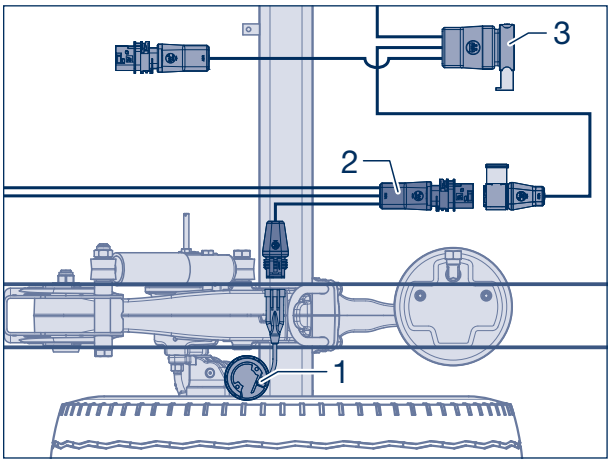


Figure 2

2 Installing the BrakePadMonitor

2.3 Cable routing for the BrakePadMonitor

[5] Mount the control unit (4) on the vehicle behind the axle boogie.

Attention!
The cable connection must be mounted horizontally or facing downwards.

Attention!
Do not connect the main distribution cable (3) to the control unit.

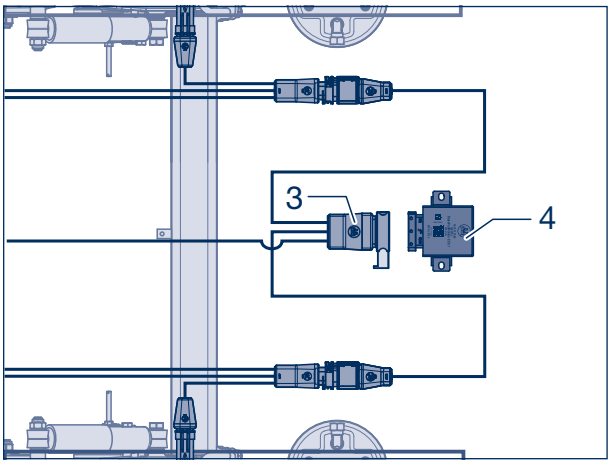


Figure 3

[6] Connect the Y-cable (5) with the TC Trailer Gateway (7) and the main distribution cable (3).

[7] If there are no bus nodes left for the Y-cable (e.g. TireMonitor), an end cap (6, termination cap) must be fitted to the free cable plug.

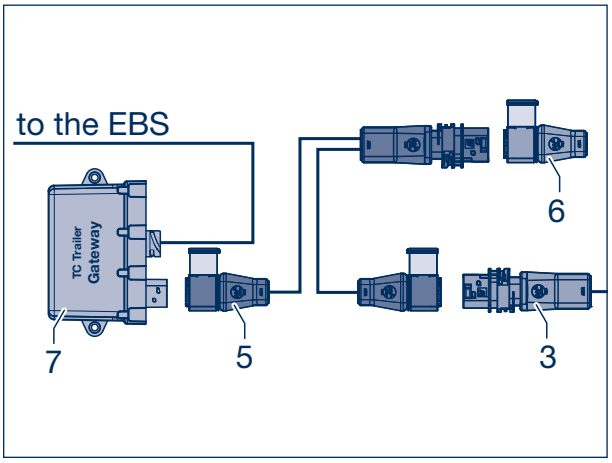


Figure 4

[8] Connect the main distribution cable (3) to the control unit.

The installation is complete.
The BrakePadMonitor will automatically link up with the TC Trailer Gateway. The time it takes until the portal or app is set up completely depends on the transmission interval of the Gateway.

If you experience any problems with the installation or commissioning, please contact BPW Bergische Achsen or idem telematics.

For the installation of the BrakePadMonitor in vehicles with more than 3 axles (see attached sheet at www.bpw.de), or with different mounting location and thereby different cable routing, please contact BPW Bergische Achsen KG.

If you have any queries relating to TC Trailer Gateway products, the technical support team of idem telematics GmbH will be pleased to assist you on weekdays from 8:00 to 18:00 CET (see contact details below). Before contacting the support team, please be sure to have the relevant product and vehicle data to hand.

Phone: +49 (0) 89 720 13 67 - 10

Email: support@idemtelematics.com

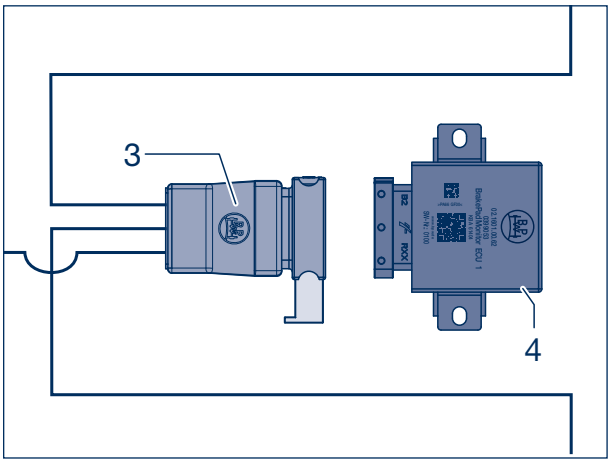


Figure 5

2.4 Technical specifications

Control unit

Dimensions:	95 x 78 x 34 mm
Supply voltage:	9 - 30 V
Power consumption:	200 mA
Mounting:	2 x screws with M6 thread and locknuts
Connection:	24 pin Delphi plug
Durability:	EMC: ECE-R10 Tightness: IP68 Good chemical resistance Weather-resistant (UV) Temperature range: –40 to 80°C

Sensoren

Wrench size:	50
Supply voltage:	5V / 30 mA
Signal voltage:	0,5 - 4,5 V
Tightness:	IP67 and IP69K
Temperature range:	-40 to 125°
Connection:	AMP Superseal 3-pin

2.5 Certificates

Sensor according to:	E1*10R05/01*8669*00
Control unit according to:	ECE R10 E1 047181

General operating permit according to §22 and §20 of the StVZO (German Road Traffic Licensing Regulations), KBA number 61404

BPW-EA-BPM 37631901e

BPW is a globally leading manufacturer of intelligent running gear systems for trailers and semi-trailers. As an international mobility and system partner, we offer a wide range of solutions for the transport industry from a single source, from axle to suspension and brake to user-friendly telematics applications.
We thereby ensure outstanding transparency in loading and transport processes and facilitate efficient fleet management. Today, the well-established brand represents an international corporation with a wide product and service portfolio for the commercial vehicle industry. Offering running gear systems, telematics, lighting systems, composite solutions and trailer superstructures, BPW is the right system partner for automotive manufacturers.

BPW, the owner-operated company, consistently pursues one target: To always give you exactly the solution which will pay off. To this end, we focus our attention on uncompromising quality for high reliability and service life, weight and time-saving concepts for low operating and maintenance costs as well as personal customer service and a close-knit service network for quick and direct support. You can be sure that with your international mobility partner BPW, you always use the most efficient method.

Your partner on the path to economic viability

BPW Bergische Achsen Kommanditgesellschaft
Postbox 12 80 · 51656 Wiehl, Germany · Phone +49 (0) 2262 78-0
info@bpw.de · **www.bpw.de**