COSBER

USER MANUAL

CAR-PLATE BRAKE TESTER

COSBER C-BTP 10

INDEX

1 Important basic information

1.1 Scope of delivery

- 2x test plate
- 2x brake force sensor
- Speed sensor with cable cover plate
- 4x up and down ramps
- 2x cable cover plate
- Digital display including wall bracket, socket adapter and power supply
- Integrated ASA live stream interface (in the display)
- Cable and assembly kit
- Documentation

1.2 Service life

The C-BTP 10 plate brake test bench was designed for a service life of around 10 years. This period depends, among other things, on the prevailing operating conditions. After this period has expired, it is necessary to either replace the test bench with a new product or to subject it to a comprehensive overhaul.

Such an overhaul may only be carried out by the manufacturer or by specialists authorized by him. During this process, the safety elements must be carefully inspected, among other things, and if necessary, other components should be replaced in accordance with the manufacturer's specifications.

1.3 Description of the test bench

To prevent potentially dangerous traffic situations that are due to an inadequate braking system of a vehicle, it is advisable to subject motor vehicles to a braking efficiency test at regular intervals and especially after brake repairs. This test is normally carried out on a brake test bench.
The C-BTP 10 plate brake test bench enables axle-by-axle dynamic braking tests and consists mainly of a floor mechanics, sensors and a display unit. Sensors are installed in the floor assembly that record braking forces and measure the impact speed. These sensors are connected to an interface module that is connected to the display unit via cable.
The display unit consists of electronic components and a central control board with firmware. On the one hand, the display fulfils the tasks of displaying the status of the test bench, user guidance and displaying the measured values. On the other hand, corresponding settings can be selected or saved using a magnetic switch.

1.4 Function of a plate test bench

To measure the braking forces of a motor vehicle, the test bench is driven on with a vehicle axle. It is necessary that the approach speed is in the range of 8 to 12 km/h. As soon as the vehicle axle is on the brake plates, the service or parking brake is applied, which brings the vehicle to a standstill on the brake plates. The approach speed is measured simultaneously and contactless by a radar sensor.
The upper plates are movably mounted and are decelerated by the force transducers. The force transducer creates a firm connection between the upper plate and the lower plate and deforms accordingly as the braking force increases, absorbing the horizontal thrust force. A strain gauge (DMS) attached to the sensor converts this mechanical deformation of the force sensor into electrical signals, which are converted into braking forces in the integrated measuring electronics in the sensor. The measurement data from the force transducers and the radar sensor are transmitted to the display unit via a digital data bus and visualized on the digital display.

1.5 Intended use

- This test bench is specifically designed for braking efficiency tests on motor vehicles. Care must be taken to ensure that the maximum axle load is observed.
- Any changes to the test bench may only be made with the express written permission of the manufacturer. If this rule is not observed, the EU declaration of conformity becomes invalid.
- The operator is obliged to carry out a risk assessment at the workplace for the test bench.
- The test bench must not be set up in operating facilities that are at risk of explosion or fire, or in damp rooms such as car washes.
- The test bench was designed for use in a temperature range of -10 to 40 °C and is designed for a maximum humidity of 65% at 40 °C. It can be used up to an altitude of 2000 m above mean sea level. Please contact the manufacturer for use in different environmental conditions.
- Depending on the equipment, the test bench can also be set up outdoors. In this case, it is advisable to consult the manufacturer or dealer.
- To ensure smooth operation, a closed, dry and covered installation location is strongly recommended.

1.6 Intended purpose

- The test bench is suitable for testing the service or parking brake systems on single-track and two-track vehicles with a maximum permissible total vehicle weight of 3.5t
- The test bench may only be operated in accordance with its intended purpose and within its performance limits, see technical data of the test bench
- The test bench is suitable for all-wheel drive vehicles
- The test bench is suitable for testing electronic parking brakes
- The test bench is suitable for trailer testing

2 Legal information

2.1 Limitation of liability

See the “General Terms and Conditions (GTCs)” of Cosber GmbH at:
https://cdn4.cdmmcdn.de/file/d0fdab5eba78c10a215fd3132a6e2ef4db70e00a/800/600

2.2 Warranty

- We guarantee that our products are free from defects for a period of 12 months.
- The warranty period begins from the time the goods are delivered to the buyer. This regulation does not apply to used products, for which any warranty is excluded.
- As part of the warranty, we undertake to carry out either a repair and/or a replacement delivery at our own discretion.
- Liability for damage resulting from defects and for lost profits is excluded.
- We reserve the right to withdraw from the contract after unsuccessful attempts at repair have been made and/or a replacement delivery is impossible.

3 Documentation

3.1 Operating instructions in accordance with EN IEC/IEEE 82079-1:2020

If not part of the operating instructions, the following documents are available:

- Assembly and commissioning instructions
- Adjustment instructions/calibration instructions
- Test book
- Test report
- Spare parts list

3.2 Service address

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Lise-Meitner-Strasse 3
D-82152 Krailling

Telephone: +49 89 26 20 766 - 00
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4 Safety

4.1 Safety instructions

- Please take the time to read and understand these operating instructions carefully before starting work
- Do not forget to observe the special safety instructions before the respective sections of the operating instructions
- The processes, sequences and the corresponding safety instructions listed must be strictly observed
- A printed copy of the operating instructions must be always kept available at the test bench
- The relevant regulations on accident prevention and health protection must be followed
- Assembly, initial commissioning and maintenance of the test bench may only be carried out by specially trained specialists. The specialist personnel include authorized, trained specialists from the manufacturer, the authorized dealers and the respective service partners.
- The display must be positioned so that the emergency stop main switch is in the immediate vicinity of the test bench.
- The display must be fully visible from the test location.
- Electrical work may only be carried out by a qualified electrician in accordance with the locally applicable regulations, guidelines and standards. An electrical test/measurement must also be carried out and recorded accordingly.
- All parts of the electrical equipment must be protected from moisture and humidity.
- The system must be de-energized during servicing work.
- During all work (including assembly, repair, maintenance work) on the test bench, it must be ensured that the display is switched off and secured against being switched on again.
- Use suitable scaffolding/platforms when working at heights.
- The general safety regulations for the use of technical equipment according to the professional association must be observed.
- Only use suitable and flawless load transport equipment to move heavy system parts.

4.2 Signal words

NOTE

denotes a potentially harmful situation. If not avoided, the product or something in its surroundings may be damaged.

ATTENTION

denotes a potentially imminent danger. If not avoided, minor or minor injuries may result.

WARNING

denotes a potentially imminent danger. If not avoided, death or severe injuries may result.

DANGER

denotes an imminent danger. If not avoided, death or severe injuries may result.

4.3 What to do in the event of a fault

If a fault cannot be rectified using the procedures described in the "Faults" chapter, proceed as follows:
Disconnect the power supply to the digital display and contact the manufacturer or your service partner.

4.4 What to do in the event of an accident

Inform first responders, rescue services and/or emergency doctors:

- Where did the accident happen (address, hall, ...)?
- What happened?
- How many people are injured?
- What injuries are there?
- Who is reporting the accident?

➔ Stay calm and answer questions!

4.5 Requirements for operating and service personnel

Only persons qualified to carry out testing in accordance with TRBS 1203 may be employed as service personnel. All persons involved in the operation, maintenance, assembly, disassembly and disposal of the test bench must:

- be at least 18 years old,
- be mentally and physically capable of doing so,
- have demonstrably received training and instruction,
- have read and understood the operating instructions, in particular the instructions on what to do in the event of a malfunction and on proper use,
- observe the locally applicable regulations on occupational health and safety,
- be able to demonstrate experience and knowledge in handling the test bench and the dangers it poses.

4.6 Product-specific safety instructions

WARNING

- It is forbidden to stay in the danger zone during entry, exit and driving over as well as during vehicle testing.
- Accessibility of the ON-OFF switch must be guaranteed.

ATTENTION

- Personal protective equipment (safety shoes, gloves) must be worn during all work on the test bench.
- Service work may only be carried out by specially authorized and trained specialists. The specialist personnel include authorized, trained specialists from the manufacturer, the authorized dealer and the respective service partners.
- The test bench may only be operated with operational safety and protective devices.
- The test bench and the work area must be kept clean.
- The work area must be adequately lit.

DANGER

- All electrical work may only be carried out by qualified electricians in accordance with the locally applicable regulations, guidelines and standards.
- When carrying out any work on the test bench, it must be ensured that the test bench is switched off and secured against being switched on again.

ATTENTION

- Suitable lifting equipment must be used when moving heavy components (> 25 kg).
- The brake test plate surface must always be free of substances such as oils, greases, etc.

4.7 Danger zone

WARNING

When operating the test bench, no people or obstacles must be in the danger zone (danger of collision between vehicle and people/objects!). This must be marked with a yellow-black marking around the test bench. For trouble-free operation, a closed, dry and covered installation location is strongly recommended.

The lengths of the vehicle installation areas before and after the test bench must be determined by the operator depending on the length of the vehicles to be tested. The demarcation of the vehicle installation area to the front and rear should be at least two vehicle lengths.

4.8 Care instructions

NOTE

The test bench must be cleaned at regular intervals:

Damage to the metal surface and paint damage must be repaired immediately to prevent corrosion, e.g. with zinc spray. To avoid damage, cleaning work must not be carried out with aggressive cleaners or with high-pressure and steam pressure devices. Regular care is the most important prerequisite for the functionality and long service life of the test bench! It is important to ensure that water can drain freely and does not accumulate in the plate brake test bench.

Daily before starting work:

- Visual inspection of the gaps and cavities between ramps and brake plates. These must be free of dirt and contaminants (such as small stones, metal parts, etc.). Vacuum with a vacuum cleaner if necessary.
- Then check that the brake plates can move freely.

Weekly:

- Visual inspection of the entire test bench and the cables for damage
- Visual inspection of the brake plate surface for contamination with lubricants. Contaminants that affect the coefficient of friction of the test plates must be removed. If necessary, remove lubricants with a suitable solvent.

Annually:

The maintenance interval specified by the manufacturer is 12 months. This maintenance interval refers to normal workshop use. If the test bench is used more frequently or under difficult operating conditions (e.g. outdoors), the interval must be shortened accordingly. Failure to do so will void the manufacturer's warranty.

5 Technical data

5.1 Identification

The complete equipment of the plate brake test bench is identified by a type of plate on the digital display with the following information:

- Article name
- Serial number
- Company name of the manufacturer
- CE marking
- Power supply
- Date of manufacture
- Report number

5.2 Technical data

Drive-over / test capacity	max. 4.000 / 3.500 kg
Test speed	8 - 12 km/h
Measuring and display range	0 - 10.000 N
Bearing	Maintenance-free roller bearings
Measuring system	Digital sensors (RS-485)
Power supply for digital display/sensors	12V DC / 5V DC
Brake plate (L x W x H)	1500 x 610 x 25 mm
Brake plate including ramps (L x W x H)	1880 x 610 x 25 mm
Track width min.	850 mm
Track width max.	2.070 mm
Track width min. (with widening)	1.000 mm
Track width max. (with widening)	2.220 mm
Total weight of test bench	ca. 130 kg
Weight per brake plate	ca. 54 kg
Weight per ramp	ca. 3,5 kg
Weight of display including wall bracket	ca. 3 kg
Operating temperature	-10° bis +40°C
Power supply	230 V/AC (EURO-Stecker)
Surface friction coefficient dry / wet	Granulation 12: 1,3 / 1,1 Granulation 24: 1,1 / 1,0
ASA live stream protocol version	1.2

5.3 Noise emissions

The noise emissions during a vehicle test are mainly caused by the vehicle's engine. This noise emission varies from vehicle to vehicle and cannot be attributed to the test bench.

6 Transport, handling and storage

6.1 Safety instructions

ATTENTION

- When loading, unloading and transporting, always use suitable lifting equipment, industrial trucks (e.g. crane, forklift truck, etc.) as well as correct load-bearing and slinging equipment.
- Always ensure that the parts to be transported are hung or loaded properly and in a way that prevents them from falling, considering their size, weight and centre of gravity. Observe the transport guidelines!

DANGER

- Electrical work may only be carried out by a qualified electrician in accordance with the locally applicable regulations, guidelines and standards. An electrical test/measurement must be carried out and recorded.
- The test bench may only be assembled and put into operation by the manufacturer's service technicians or by authorized service partners.

NOTE

- All parts of the electrical equipment must be protected from moisture and humidity.
- The test bench must not be installed and operated in rooms or washing halls where there is a risk of explosion.
- The operator must provide optional safety measures (e.g. warning lights, barriers, monitoring personnel presence in work pits, etc.), depending on local conditions.

ATTENTION

- Wear personal protective equipment (safety shoes and gloves). Personal protective equipment must meet the safety requirements for the respective work.
- The display must be hung in a safe area and folded against the wall when not in use.

6.2 Packaging

The C-BTP 10 plate brake tester is shipped from the factory packed on a pallet as standard. The contents of the delivery must be checked for damage and completeness in accordance with the order confirmation. Transport damage must be documented immediately and reported to the deliverer.

6.3 Transport and handling

- Transport and handling of the test bench is only permitted in the original packaging
- The packed test bench can be moved on the pallet using a forklift

ATTENTION

- The brake plates may only be placed at the intended assembly point by at least two people

- The access to the assembly point must be easily accessible for transport vehicles or equipment

- The customer must have a lifting device for the test bench weight for unloading, moving and setting down at the assembly point
- The customer must ensure that the assembly point is free of hazards

6.4 Storage

The packed test bench must be stored in a covered place protected from direct sunlight. Storage must take place at a temperature between -15 °C and +60 °C. Packaging residues must be disposed of in accordance with applicable environmental regulations.

7 Maintenance

7.1 Maintenance

Repair and maintenance work may only be carried out by authorized service personnel. Contact the manufacturer or your service partner for this.

7.2 Calibration capability test (routine test) / calibration

The calibration capability test and calibration must be carried out by an authorized and trained service partner / calibration service provider before the first use:

- It must be repeated at least every 2 years
- The calibration capability test must be carried out after the test bench has been repaired if components relevant to the measurement have been replaced
- Before the defects have been remedied, the test bench must not be used for brake tests in accordance with Section 29 of the Road Traffic Licensing Regulations in conjunction with Appendix VIII of the Road Traffic Licensing Regulations
- The date for the next calibration capability test must be displayed in a suitable place on the test bench using a test sticker.

8 Main components

The test bench consists of two test plates with brake force sensors, a radar sensor and a digital display with an integrated ASA live stream interface. All components are connected to each other via a digital data bus.

8.1 Test plates

- The test plates are galvanized and sealed as standard
- The test plates may only be installed above ground
- The test plates are coated with a corundum coating, which enables a very high level of friction between the tires and the brake plates
- The brake force sensors installed in the test plates provide digital, processed and calibrated measured values for display

8.2 Display

- The display has three four-digit segments and shows: braking force on the left, speed / braking force difference and braking force on the right
- The electronics (measuring amplifier and conversion) are located directly in the sensors
- All data transmission takes place via an RS-485 bus system
- The measuring and evaluation components are subjected to a permanent self-test
- Temperature drift in the force sensors is compensated for by dynamically adjusting the zero point.

8.3 ASA livestream interface

- The test bench is equipped with an ASA livestream interface (RJ-45 Ethernet socket). Marked with a sticker on the right side of the display.
- All measured values measured by the test bench are available on the ASA live stream interface
- The test bench can be identified by a unique identifier (DLOC)

8.4 Speed measurement

- The speed of the approaching vehicle is continuously measured and transmitted using the radar sensor
- As soon as a tangential thrust force is measured when driving onto the test plates, the impact speed is recorded. From the course of the tangential thrust force and the impact speed, the course of the speed during braking is precisely determined using the law of conservation of momentum and the average tangential thrust force of the vehicle that has been hit is evaluated from an average of approx. 5 km/h to approx. 2 km/h.
- The required impact speed is between 8 and 12 km/h and the minimum measurement time of 0.4 seconds. is monitored by the measuring system
- If the approach speed does not move within the required test speed of between 8 and 12 km/h when a braking force is detected and the minimum measuring time of 0.4 seconds is not reached, the invalid measurement is aborted (flashing display) and the maximum tangential thrust force is output.
- The minimum measuring time of 0.4 seconds is required to prevent sudden impacts on the braking force sensors and thus incorrect measured values.

- Speed measurement with the radar sensor has the advantage that the approach speed is also permanently recorded in parallel with the braking force. The contactless speed measurement works very precisely and detects the onset of braking with the utmost accuracy.

9 Installation conditions

9.1 Test plates

- The test plates may only be installed above ground

WARNING

- The test plates must be positioned so that there is sufficient distance in the direction of travel and to the side when driving on and over them. If necessary, barriers or colour markings (warning paint according to DIN 4844) must be attached to the floor around the test area
- The cable routing (empty pipes, etc.) for the display must be available on site.
- The test plates must be attached using the included mounting kit, see installation instructions

9.2 Digital display

- The digital display is mounted on a wall using the included wall bracket
- The digital display must be positioned so that the measured values can be easily read from the driver's seat to the front during the brake test
- The display is powered by a 230V/AC plug-in power supply (with EURO plug)

9.3 Foundation and floor

- A flat floor with concrete quality C20/25 or equivalent is required for attaching the test plates
- Installation on paving stones, asphalt or similar is not permitted!

9.4 Environmental conditions

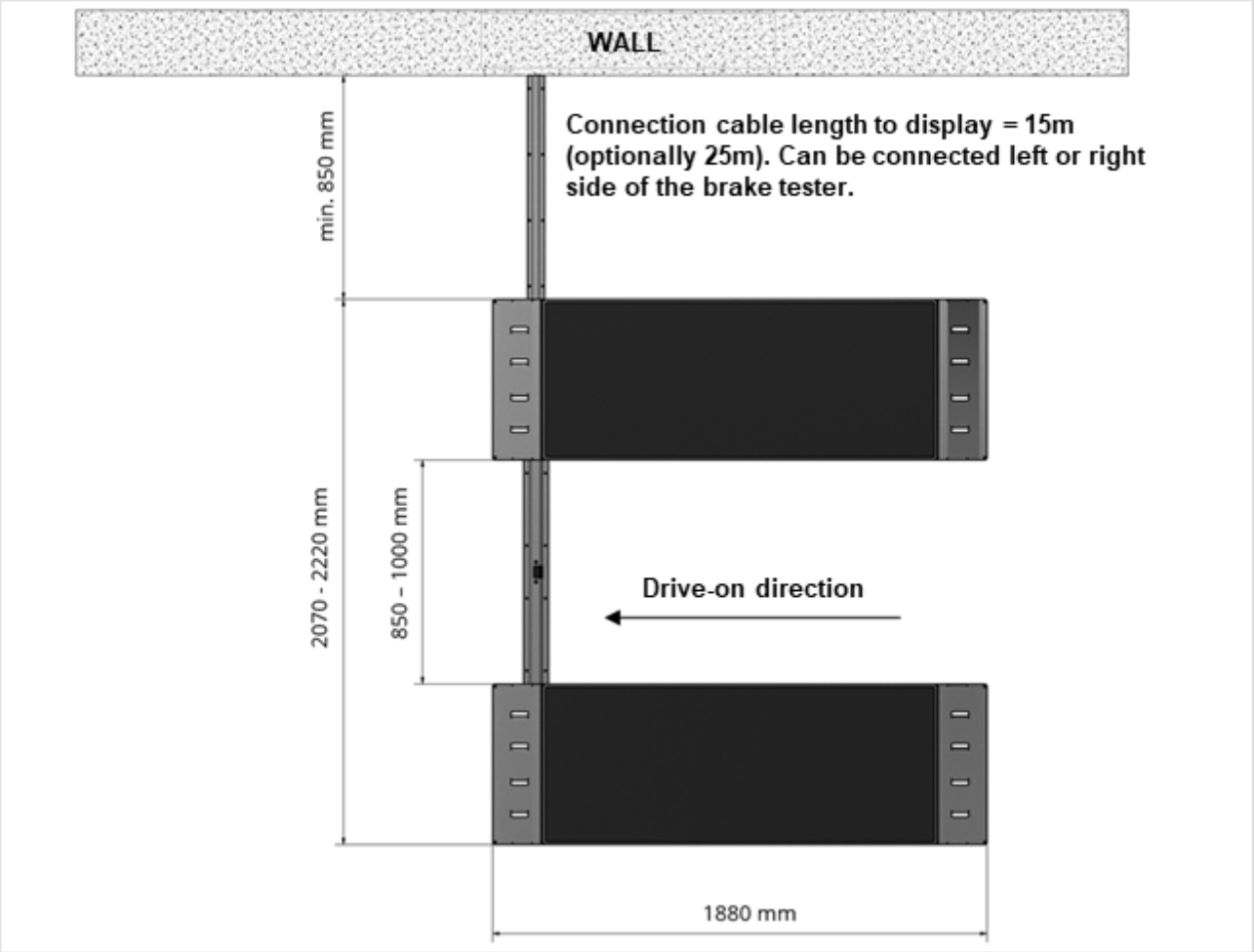
- The brake plates are suitable for outdoor use and meet the requirements of protection class IP 54 (protected against dust and splash water).
- The test plates must not be under water
- A roof is required for the digital display when used outdoors! - Using the test bench in an area that is not protected from the weather can shorten the product lifespan

9.5 Power supply connection

The power supply connection (230V/AC socket) must be available on site to supply the display (max. 0.5m distance from the display).

9.6 Total space requirement

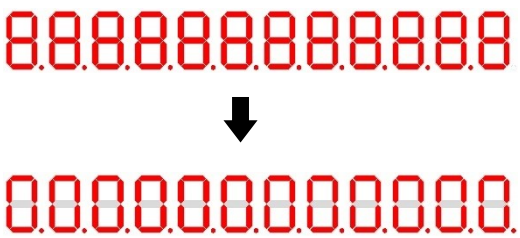
See the “Installation requirements” document for further information.



10 Operation

10.1 Switching on the test bench

- ✓ The test bench must be unloaded
- ✓ Plug in the power cable of the digital display
- ✓ Switch on the 230V socket adapter

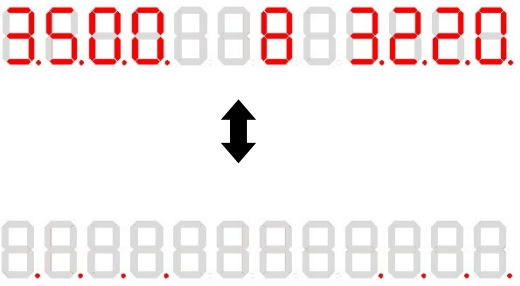
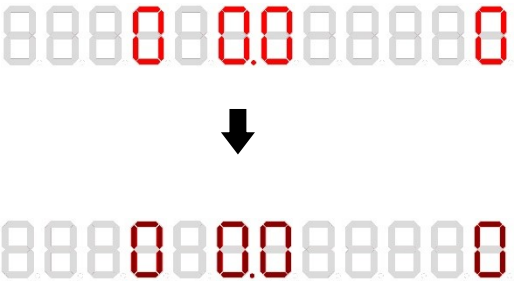
Description	Display
The display starts and all segments are activated and carry out a self-test, the display shows the following:	
The display starts a countdown with a segment test, counts down and shows the following:	
The software version is finally displayed, here V3.33	
The test bench is now ready for operation, the display shows the following:	

During the start-up phase, the display electronics perform a self-test and configure the test bench. The zero point of the brake force sensors is also reset.
If a brake plate is tense during start-up or a pushing/pulling force acts on it, an error message "EE" appears on the display. See also the "Error messages" section.

10.2 Notes on testing

- The safety regulations must be observed
- Drive the vehicle onto the test bench smoothly and without swinging and apply the brakes evenly
- The measured values are shown on the display and overwritten during the next test
- A measured value is always output via the ASA live stream interface

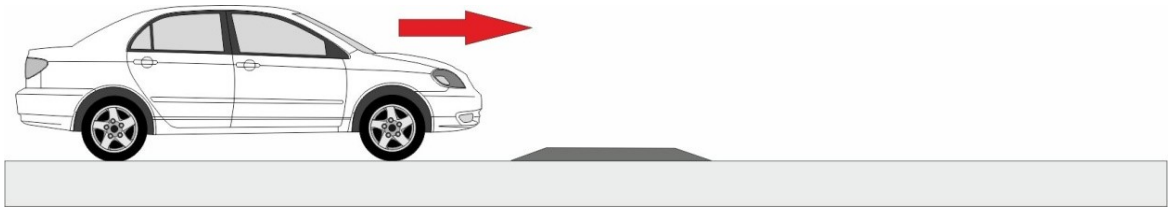
10.3 Display functions

Description	Display
The test bench is ready for use	
When ready for use, the point of the 12th segment also flashes continuously:	
The test bench measures a speed and displays it live on the middle segment:	
The test bench has completed a measurement within the speed limits (8-12 km/h). The display shows the integral mean value of the left and right sides, as well as the deviation in percent. The measurement result is valid for the service brake. The measurement result is displayed for approx. 8 seconds.	
The test bench has completed a measurement outside the speed limits (below 8 km/h or above 12 km/h). The display shows the peak value of the left and right sides, as well as the deviation in percent. The output flashes and 4 points are displayed on the bottom left and right. The measurement result is only valid for the parking brake. The measurement result is displayed for approx. 8 seconds.	
If the test bench is not used for 20 seconds, the display automatically reduces the brightness of the segments. Full brightness is activated again when used.	

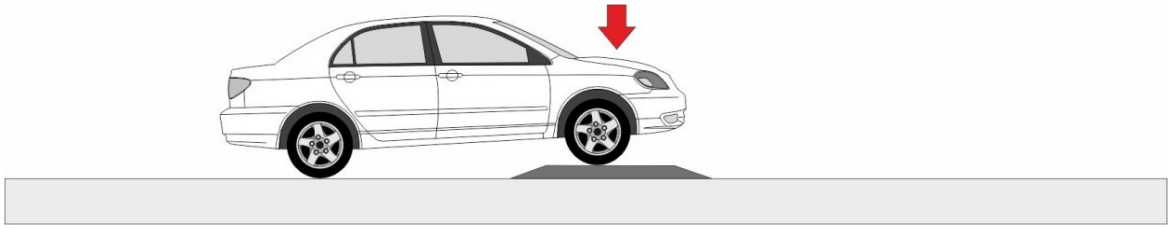
10.4 Service brake test procedure

Schematic test procedure for the service brake for the front axle

Drive onto the brake plates at a speed of 8 - 12 km/h



Brake the vehicle with the front axle to a standstill on the brake plates



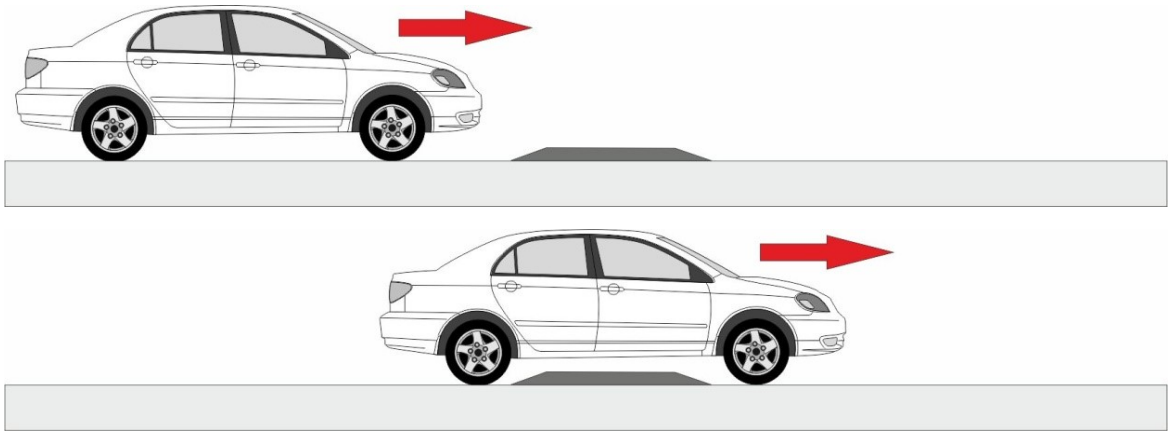
Remain on the brake pedal until the vehicle no longer swings. The left and right braking force of the front axle and the difference in % are displayed. The measured values are frozen for approx. 8 seconds, after which a new test is started.

➔ If the displays are flashing, an invalid measurement has been detected (too low/too high approach speed) - the measurement is invalid for the service brake and must be repeated!

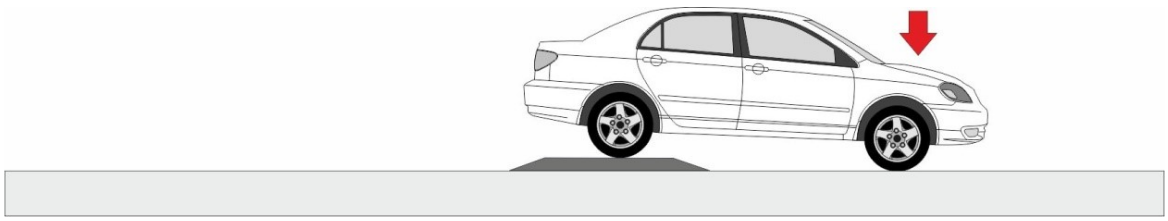
➔ If the approach speed is invalid, the peak value and not the integral mean value is output - the measurement is only valid for the parking brake!

Schematic test sequence for the service brake for the rear axle

Reset to the starting position and drive the front axle over the brake plates at a speed of 8 - 12 km/h.



Brake the vehicle with the rear axle on the brake plates until it comes to a standstill.



Remain on the brake pedal until the vehicle no longer swings. The left and right braking force of the rear axle and the difference in % are displayed. The measured values are frozen for approx. 8 seconds, after which a new test is started.

➔ If the displays are flashing, an invalid measurement has been detected (too low/high approach speed) - the measurement is invalid for the service brake and must be repeated!

➔ If the approach speed is invalid, the peak value and not the integral average value is output - the measurement is only valid for the parking brake!

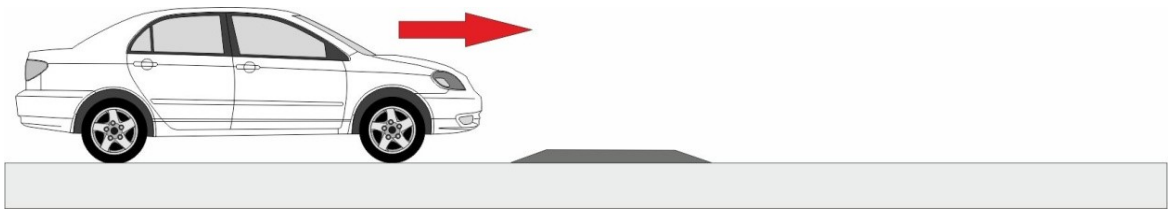
10.5 Parking brake test procedure

Schematic parking brake test procedure

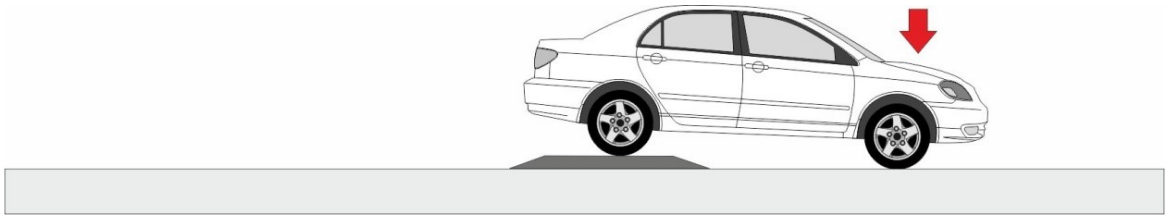
The parking brake test procedure can be carried out in the same way as the service brake test (as with the front or rear axle).

When testing the parking brake, the approach speed is not specified.

Recommendation: between 8 -12 km/h



Drive the vehicle onto the brake plates and apply the parking brake quickly (but not abruptly) until the vehicle comes to a stop.



The left and right braking force of the parking brake and the difference in % are displayed. The measured values are frozen for approx. 8 seconds, after which a new test is started.

➔ The measurement is valid whether the measured values are flashing or not flashing.

10.6 ASA-Livestream

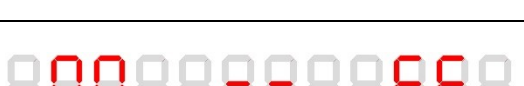
The ASA livestream interface is functional as soon as the test bench is commissioned and ready for use. The ASA livestream interface is located on the right-hand side of the display and is marked with a corresponding sticker. On the back of the display there are LEDs that describe the system status of the interface.

Description	Function	LED
POWER	ASA converter is on	
DEVICE	Test bench sends data to ASA converter	
ETHERNET	LAN/ETHERNET connection is active	
DHCP / IP	IP address has been assigned	
NETMAN	Connected to network manager	
LIVESTREAM	Livestream data is sent to the client	

All LEDs must light up to transmit the ASA livestream data to a client!

11 Troubleshooting and correction

If errors occur, error messages are displayed:

Description	Display
Brake force sensor on the left – no communication	
Brake force sensor on the right – no communication	
Radar sensor – no communication	
All sensors – no communication	
Brake force sensor on the left – overload Braking force during test > 10,000N	
Brake force sensor on the right – overload Braking force during test > 10,000N	
Brake force sensor on the left and right – overload Braking force during test > 10,000N	
Brake force sensor left – tension Sensors are tensioned after testing or when restarting - zero point too high/low	
Brake force sensor right – tension Sensors are tensioned after testing or when restarting - zero point too high/low	

Brake force sensor left and right – tension Sensors are tensioned after testing or when restarting - zero point too high/low	

To resolve the error(s), please contact the manufacturer or your service partner!

12 Menu of the digital display

The configuration menu is called up using a magnetic switch with the magnet provided. Place the magnet on the "target sticker" marking on the digital display and the following menu items will be scrolled through. The respective menu item is selected by removing the magnet.

Description	Display
Magnet detected – the 4 points of the first 4 segments light up:	
Menu item Calibration: “CC” Measured values are output live – division 1N	
Menu item Take zero point: “nP” Set zero point of the brake force sensors	
Menu item Teach sensors: “AA” The addressing (side) and measuring direction are assigned.	

Further information on the menu items and functions can be found in the assembly and commissioning instructions.

13 EU Declaration of Conformity

See the supplied product documentation.

14 Notes

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