S. Bleyer GmbH

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VEHICLE FIXATIONS

MONITOR SYSTEMS

EXHAUST TECHNOLOGY

TEST CELL PERIPHERALS


techSAT
FROM AVION
AUTOMOTIVE
HAINZL
MONITORANLAGEN
FAHRZEUGFIXIERUNG
ABGASTECHNIK
S. Bleyer GmbH
www.s-bleyer-gmbh.de

We at S. Bleyer GmbH not only define ourselves through competence and expertise, but also through our human qualities, our rough edges and our togetherness.

We're all sorts of things – young and old, funny and serious, ingeniously messy and meticulous. We're more than a team, even if we're sometimes rowdy with each other, because we love our job.

Not everyone can do everything, but everyone can do something, for example get coffee, bend iron, annoy the boss, feed the fish and even perform mechanics.

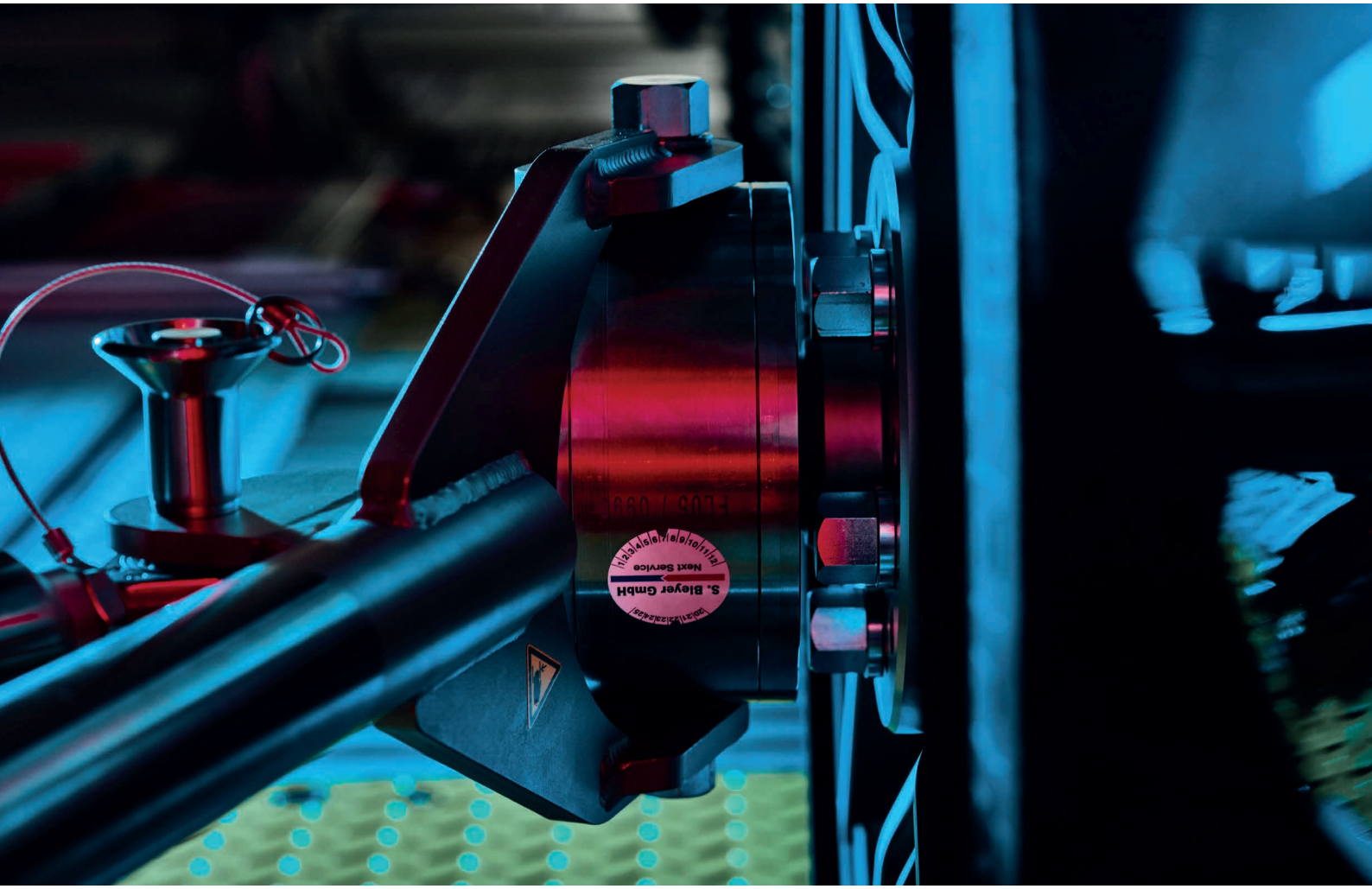
We don't always take ourselves very seriously, but we deliver precise work out-of-the-box and we solve your problems.

Our boss says:

"Humanity before consequences."

And that's good.

VEHICLE FIXATIONS



Physics

Principle: The vehicle is fixed without any pre-tension and connections free of play.
Design: Rod triangles and floor anchors.
Fixation: Frictional clamping of stainless-steel rods in EPDM shells.
Horizontal movement and forces: are restrained by the rods.
Vertical movements and forces: are not restrained (intended degree of freedom).

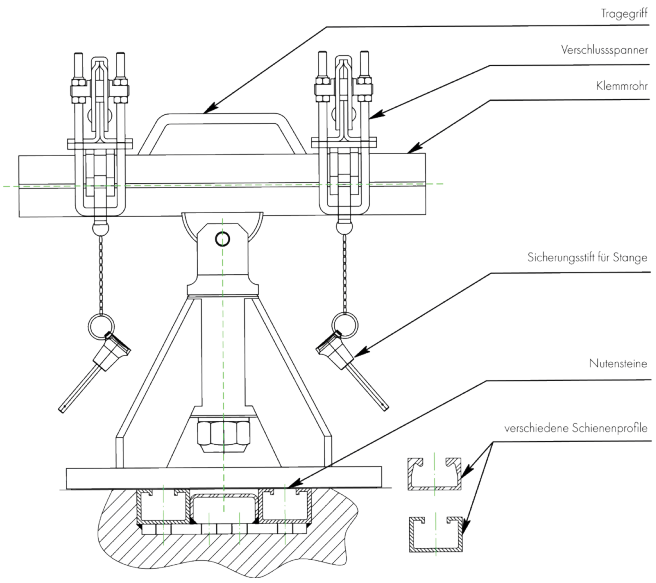
Operational data

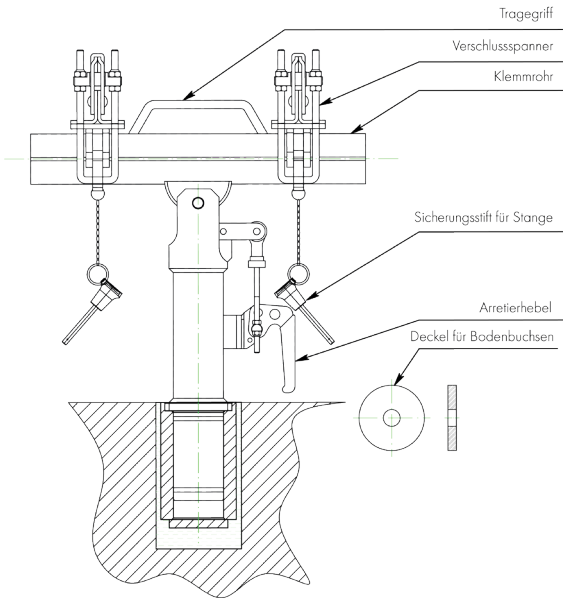
Vehicle: standard passenger car, heavy-duty, prototype, test vehicle, vehicle without a towing hook
Vehicle mass: **up to 3,500kg, 3,500–7,500kg, up to 40,000kg**
Speed: **max. 300km/h (e.g. Bugatti even 400km/h)**
Vehicle engine: front-wheel drive, rear-wheel drive, all-wheel drive, electric drive
Testing: one-axle operation, two-axle operation
Test bench: endurance test, outdoor terrain test, wind tunnel, acoustic test stand, high-altitude climate chamber **(-40°C bis +60°C)**
Set-up time: Allow a few minutes on the test bench and fixation can be carried out quickly and easily by one operator

Fixing a vehicle on the test bench

The purpose of vehicle fixation is to fix vehicles with front, rear or all-wheel drive on various rollers and belt dynamometers quickly, safely and without any pre-tension nor play. Rod triangles and floor anchors firmly connect the vehicle to the floor of the test cell. Fixation is performed by the frictional clamping of the stainless-steel rods in the EPDM shells. The rods restrain horizontal movements and forces, while vertical movements and forces are not restrained. The fixation can be adjusted steplessly to the vehicle width, length and height.

Two different vehicle fixation systems have been developed by S. Bleyer GmbH: the hook fixation and the wheel hub fixation. Both systems have been used successfully since 1999 and 2005 respectively by the automotive industry and test laboratories in research and development.



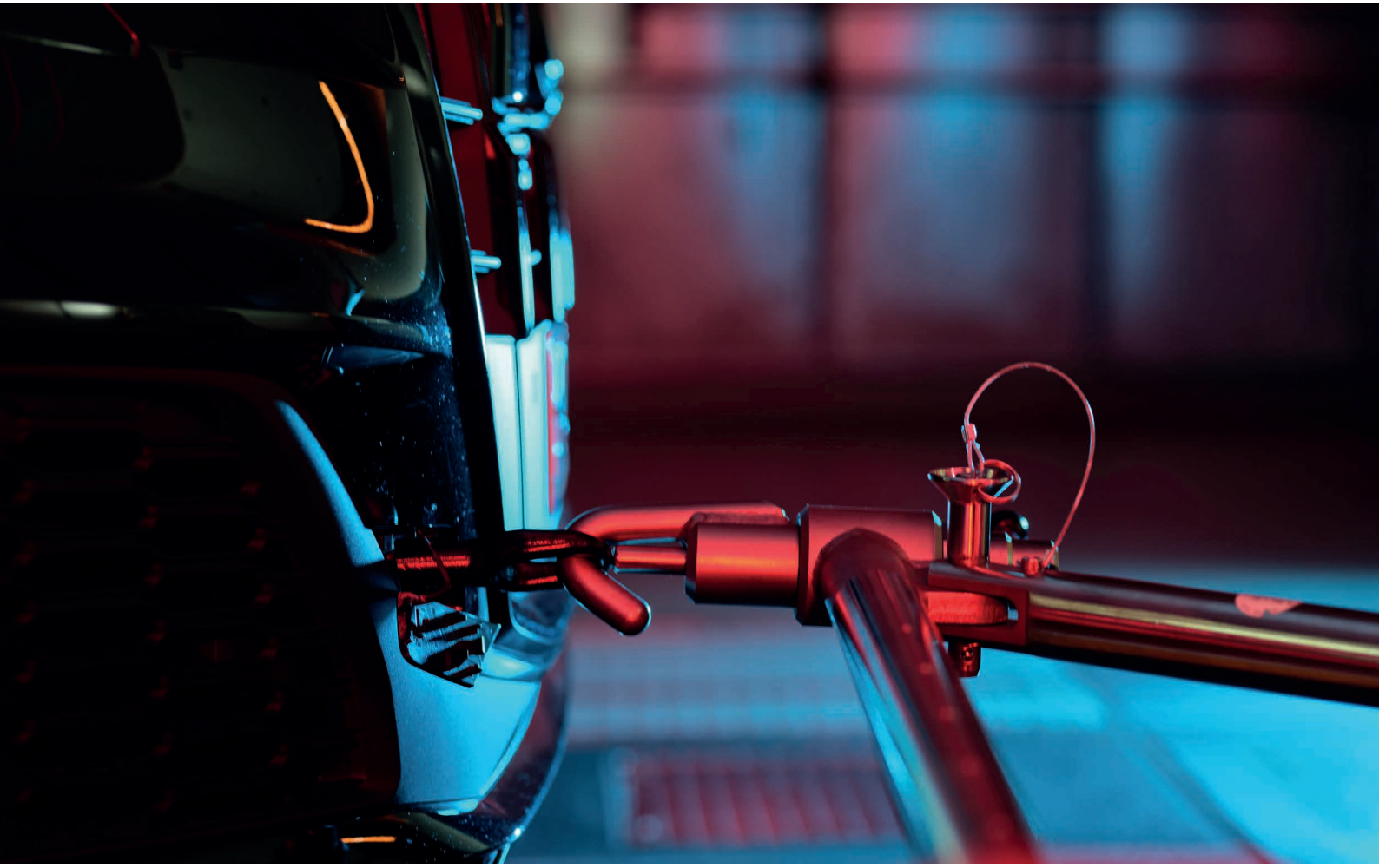


Vehicle fixations are offered for three vehicle types in three versions:

- Cars up to 3.5t total weight
- MDV (medium duty vehicles) up to 7.5t total weight
- Trucks and heavy commercial vehicles up to 40t or 11t axle weight (!)

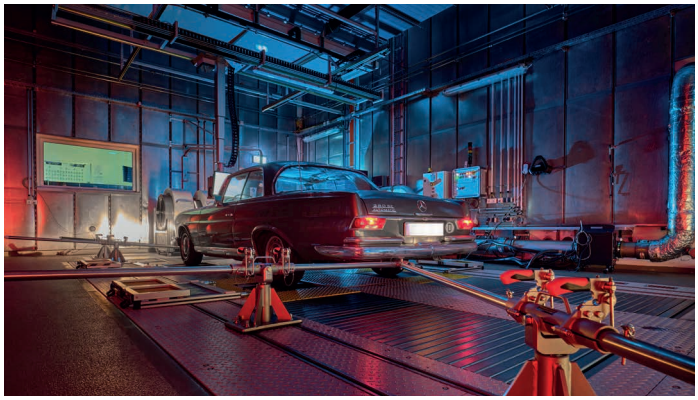
For more information, visit our website.

HOOK FIXATION



Intended use

The task of the hook fixation is the fixation of passenger cars fast, safe and without any tension with front wheel, rear wheel or four-wheel drive on various roller or belt dynamometers using the towing eye or trailer coupling as fixation points. The vehicle is restrained at the front and rear with fixation rods. These rods are held by plug-in or sliding anchors by being clamped in the rubberized clamping collets. Possible areas of application include single roller dynamometers in single and dual-axle operation, double-roller test benches in single and dual-axle operation and belt dynamometers.



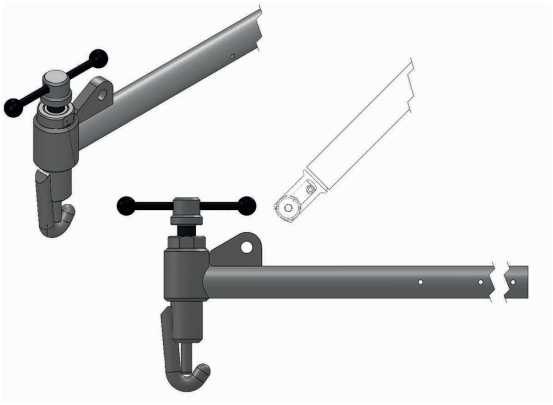
Technical characteristics

Vehicle mass: max. 2,500kg
Acceleration: max. 4.0m/s²

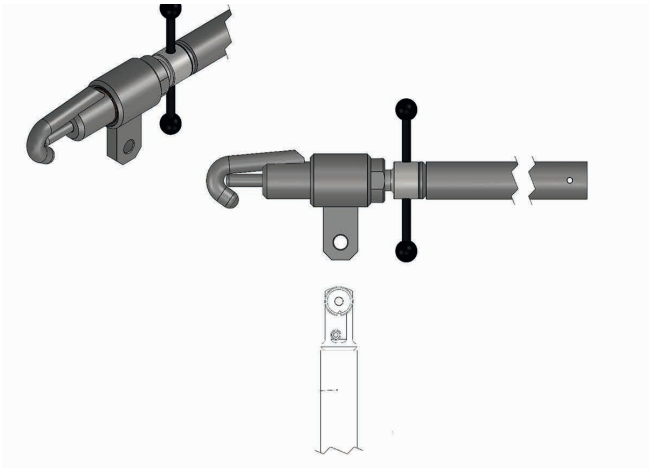
Maximum tractive force: max. 10,000N
Full braking: Emergency braking only!

Fixation rods

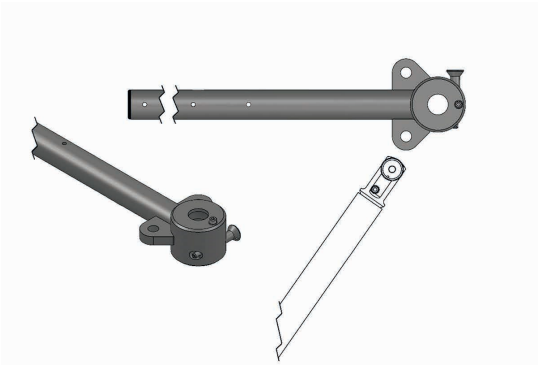
The cross rod and tractive rod have hooks, and the trailer coupling rod has a pick-up head. The hook or pick-up head is hooked into the towing hook or attached to the trailer coupling in just a few simple steps. The diagonal rod (DST) is firmly connected to the first rod and is used for lateral stabilisation.



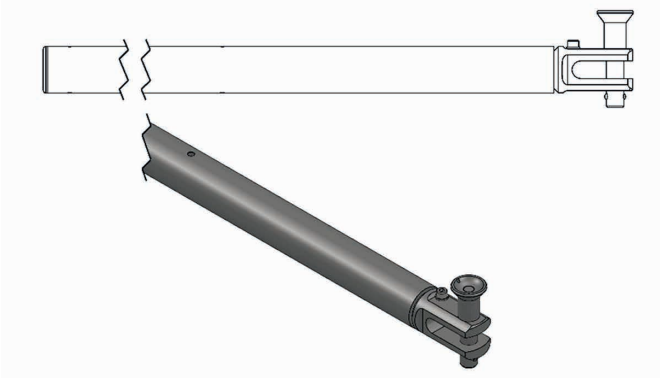
The cross rod (QST) runs transversely to the longitudinal axis of the vehicle. This is ideal when there is no space behind or in front of the vehicle.



The tractive rod (ZST) is installed parallel to the longitudinal axis of the vehicle. The ZST absorbs the longitudinal forces best.

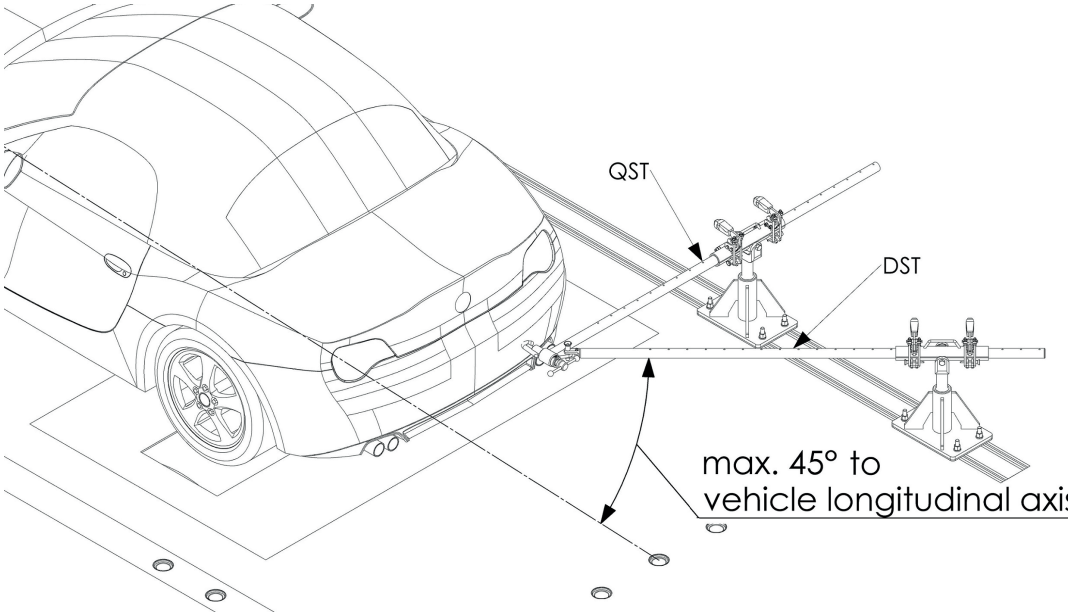


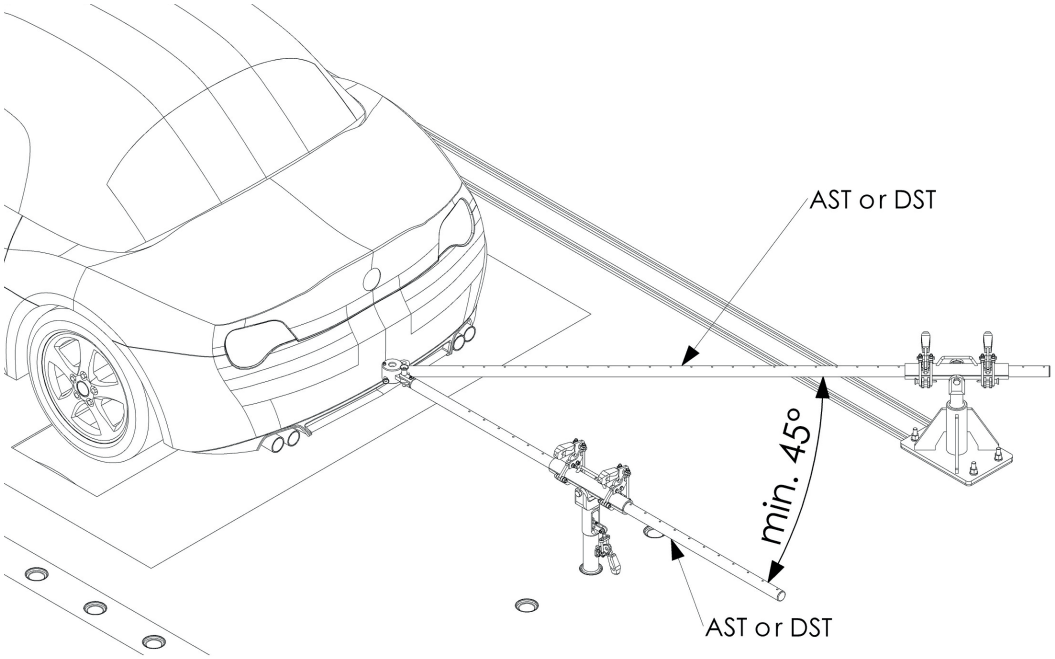
The trailer coupling rod (AST) is available to fix the rear of the vehicle to the trailer hitch. A mounting unit is placed on the coupling.

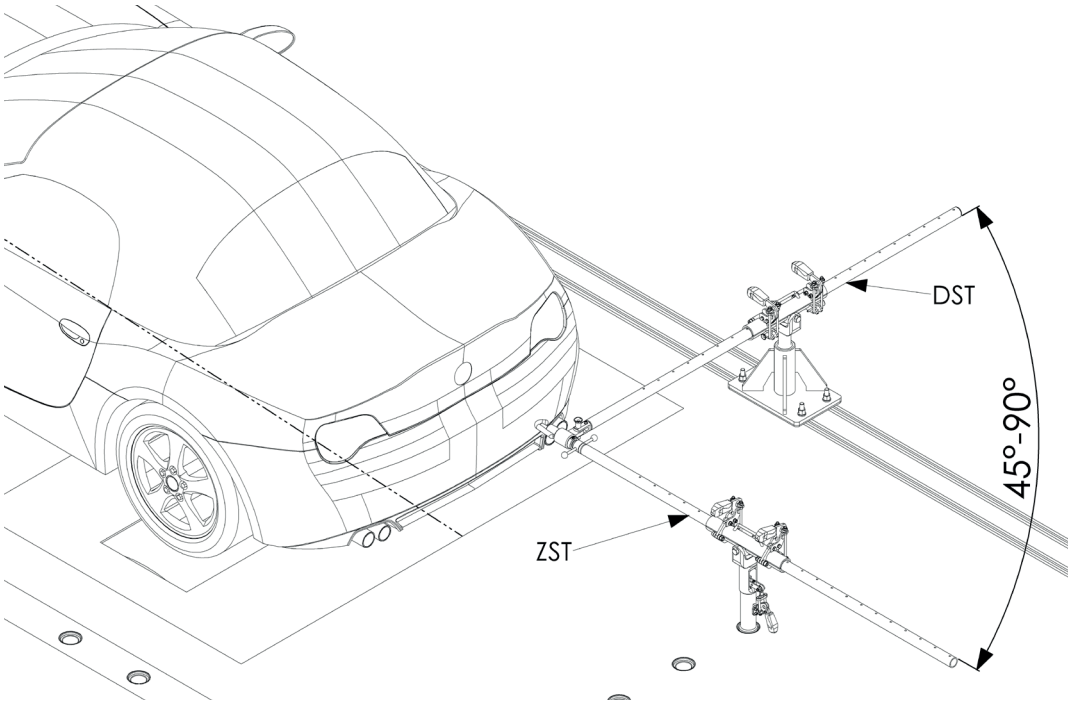


The diagonal rod (DST) forms the fixation triangle together with the QST, ZST or AST. A ball lock pin securely connects the rods together.

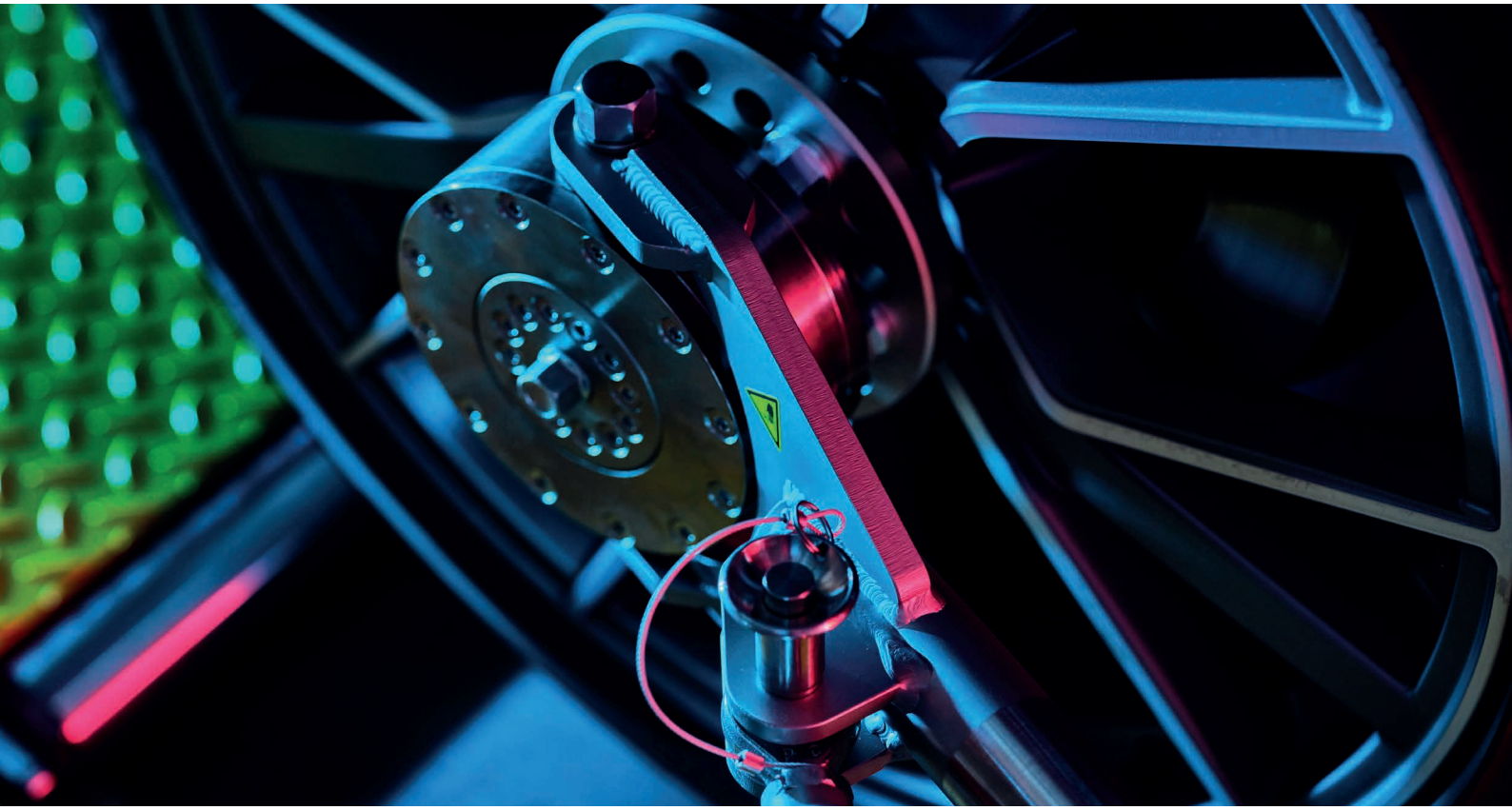
HOOK FIXATION
CONFIGURATION EXAMPLES


QST
DST
max. 45° to
vehicle longitudinal axis


AST or DST
min. 45°
AST or DST


DST
45°-90°
ZST

WHEEL HUB FIXATION



Wheel Hub Fixation

The wheel hub fixation is suitable for standard passenger cars, test vehicles and prototypes up to 3.5t. To fix the vehicle, two fixation rods and a fixation bearing are attached to all moving wheels. The rotating mass on the wheel hub is negligibly small. These rods are clamped in plug-in anchors or sliding anchors and thus connected to the test floor. This type of fixation makes it possible to run all test cycles and test scenarios, and can be used for all vehicle types in this weight class.

Technical characteristics

Vehicle mass: max. 3,500 kg
Acceleration: any

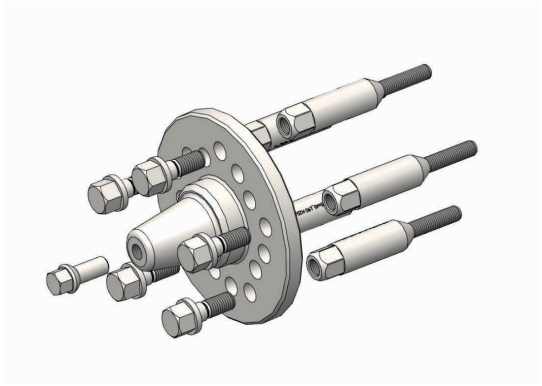
Maximum tractive force: max. 35,000N
Full braking: possible without problems

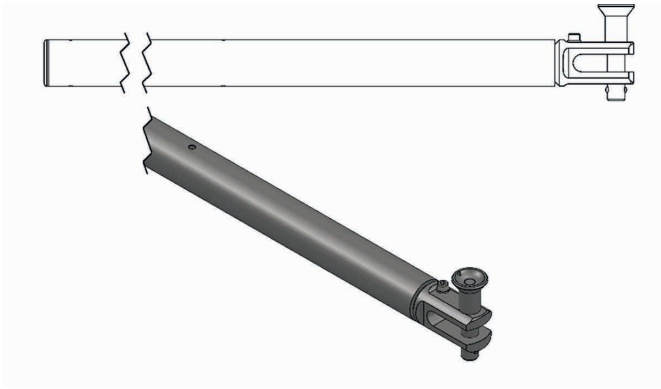
Bearings and fixation rods

One of the two rods per fixation triangle is firmly screwed to the fixation bearing. This bearing is placed on a cone-shaped adapter that is previously mounted on the wheel.

The second rod is connected to the first rod with a ball lock pin. It is used for lateral stabilisation.

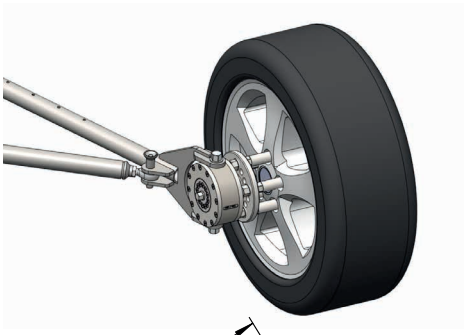
The bearing can be used for test runs up to 300km/h.



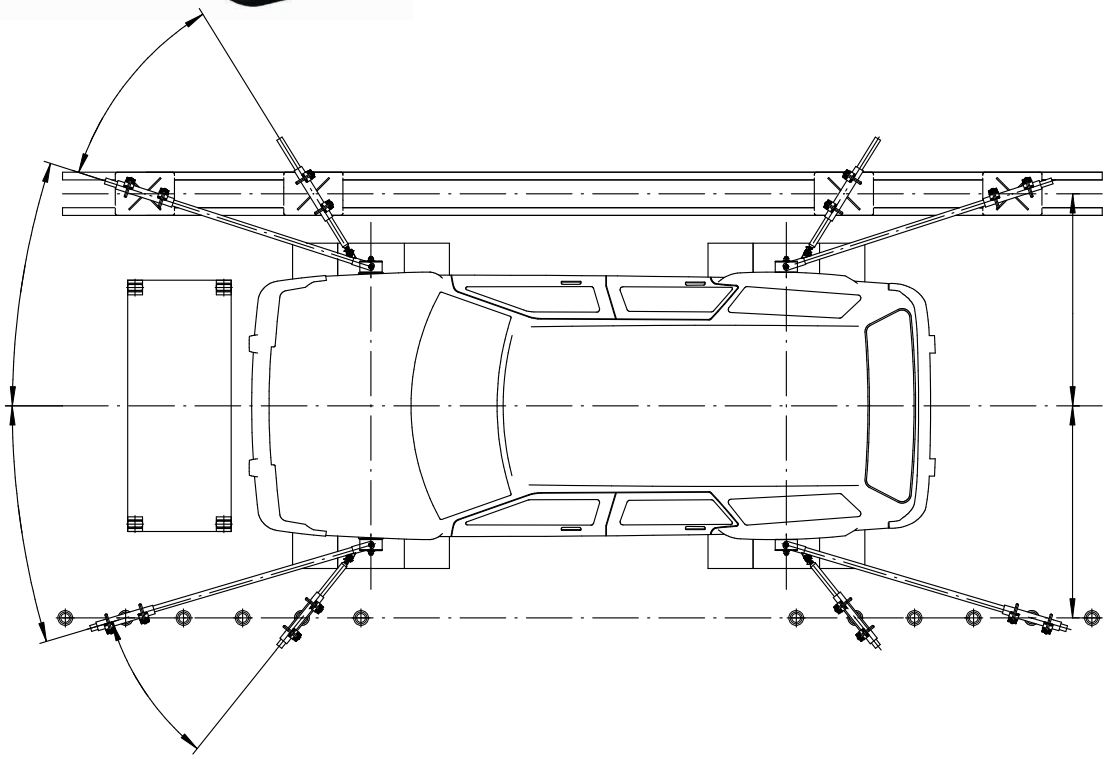


The thread adapter (GA), rim adapter (FA) and connecting screw (VS) are pre-assembled on the vehicle. This is usually done outside the test bench.

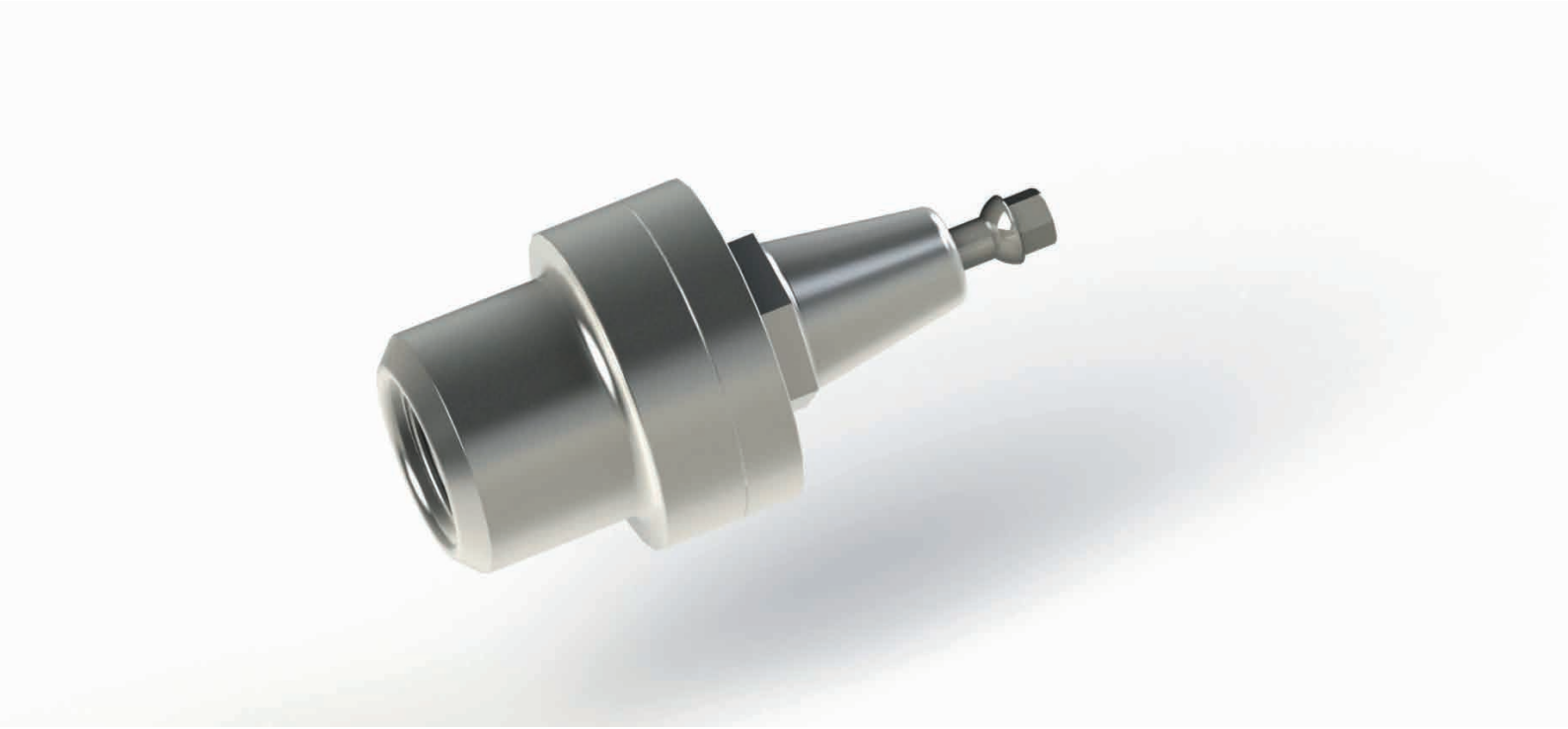
The wheel hub rod (RST) is screwed to the fixation bearing (FL). The bearing is mounted to the wheel hub on the pre-assembled rim adapter (FA). This connection is made with just one screw – quick, easy and still safe.



The diagonal wheel hub rod (DRST) forms the fixation triangle with the wheel hub bar (RST). A ball lock pin ensures the secure connection of the two rods. The fixation triangle restrains horizontal movement and forces.



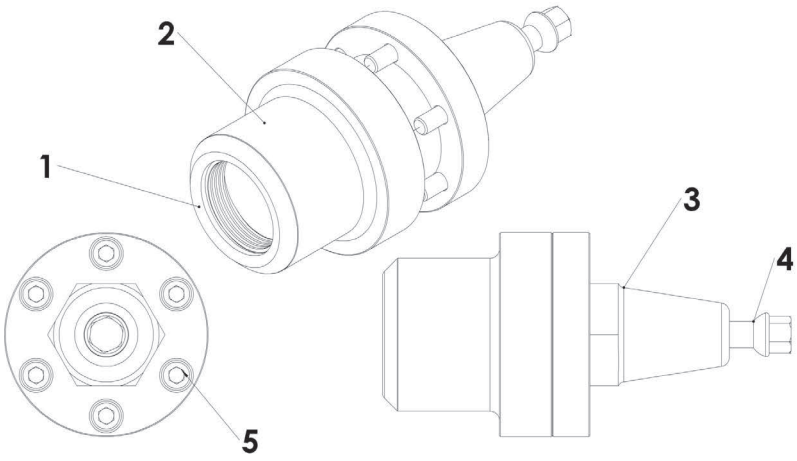
CENTRAL SCREW ADAPTATION

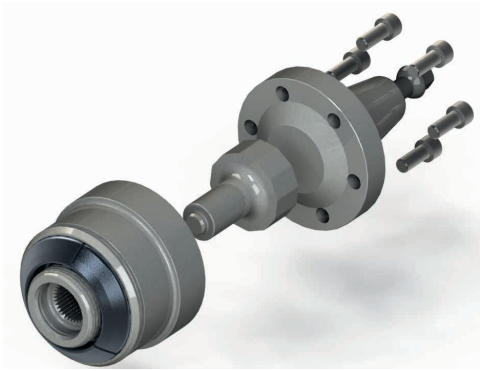


Central screw adapter

The central screw adapter enables the fixation of sports vehicles where the rim is held by a central screw or nut. The central cone adapter is used instead of the thread and rim adapter. The central screw is reproduced on the rim/hub side and mounted in an identical way. On the cone adapter then, as usual, the fixation bearing is attached.

The central screw adapters must be designed and manufactured individually for each vehicle type. For this purpose, we require samples of the central screw from the customer side or the CAD data.





[1] Replicated thread and shape of the original central screw
[2] Basic adapter
[3] Cone adapter for the fixation bearings
[4] External wheel bolt RS05
[5] DIN912 M10×25 connection screw

EMC COMPATIBLE RODS

Fibreglass rods

To avoid unwanted antenna effects of vehicle fixation components for EMC testing, we also offer the fixation rods in a fibreglass version.

The stainless-steel rods of the classic hook and wheel hub fixation are here optionally replaced by fibreglass rods with the same outer diameter and strength.
This significantly reduces the influence of interference emissions on EMC measurements.

AERIAL FIXATION

Aerial Fixation

There is an optimised variant of the wheel hub fixation for the requirements of a test bench for aerodynamics tests.

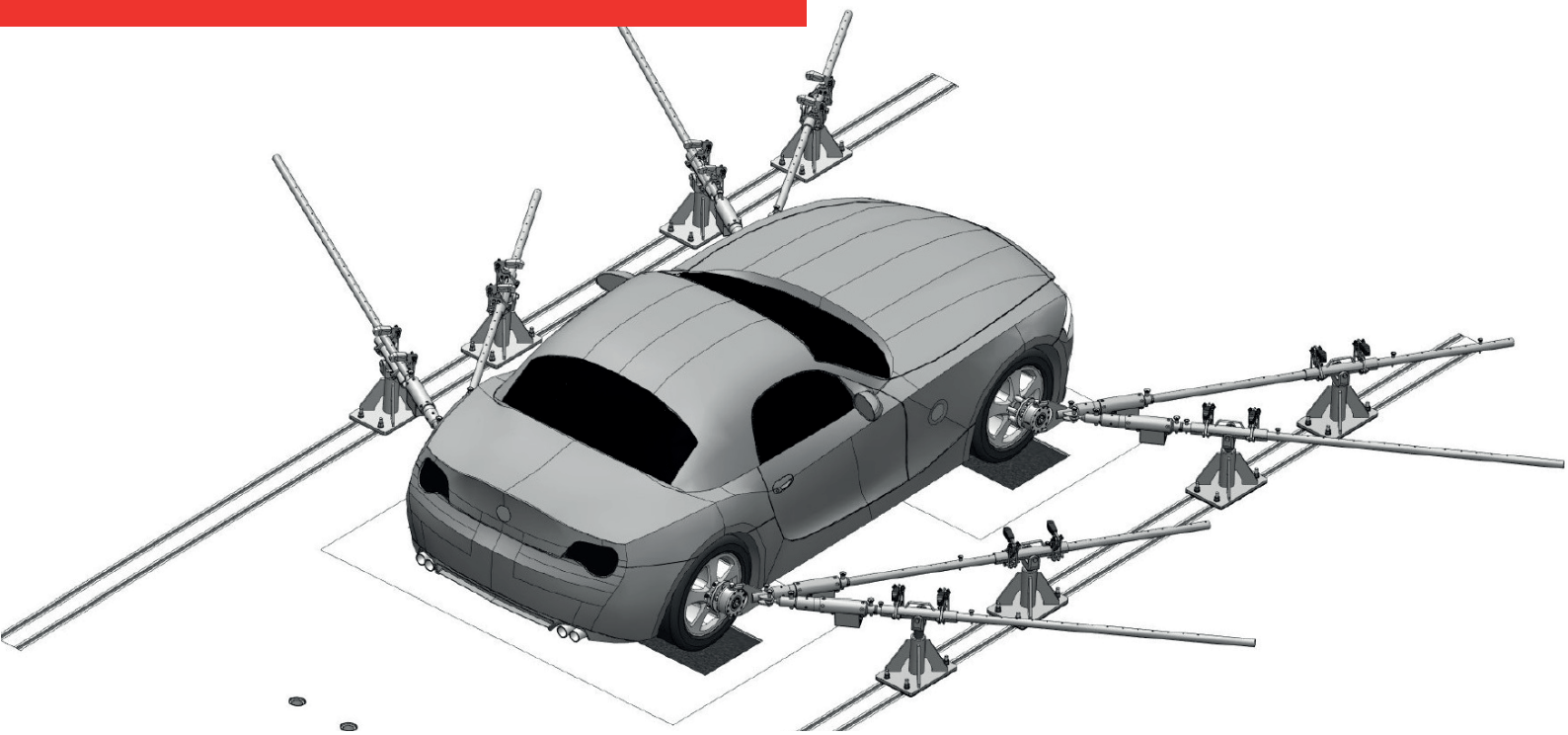
- The sliding anchor is narrower and aerodynamically shaped.
- The clamping collet is optimised to have the fewest interfering contours possible.

- The fixation bearing is smaller and the fork head is also significantly optimised.

Here, the focus is not on strength; therefore, this variant is, for example, well suited for simple drag measurements.

QUICK-DECOUPLING ELEMENT

IMPORTANT PART OF A SAFETY CONCEPT!



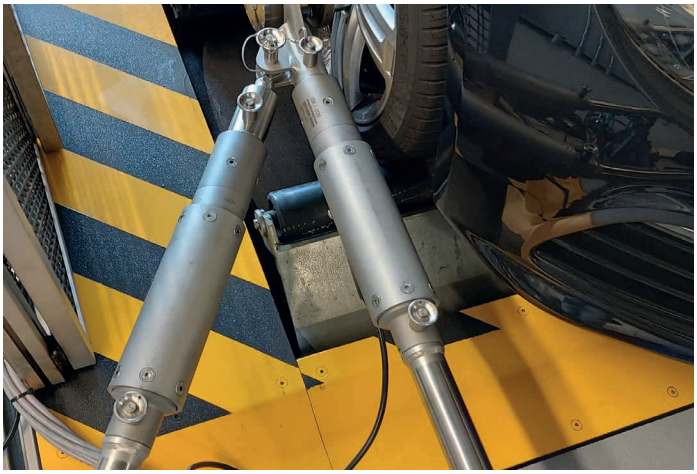
Innovation in vehicle fixation

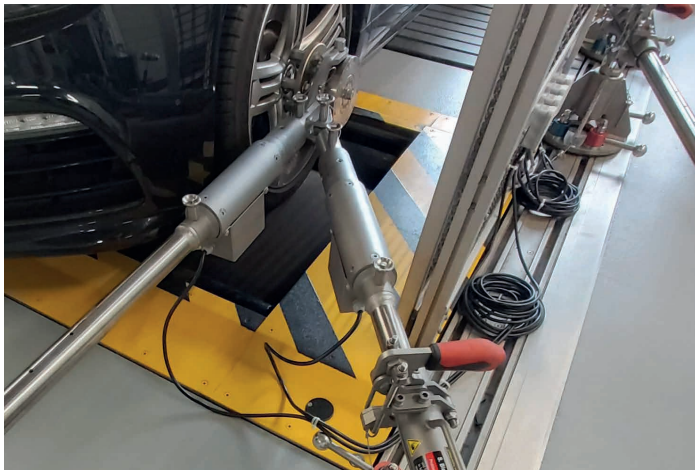
In addition to our wheel hub fixation, we offer a quick-decoupling element, which allows you to decouple the rods of the wheel hub fixation telescopically and, above all, **destruction-free** within seconds by remote. The purpose of this element is to release the fixation in an emergency evacuation.

This technique can be particularly useful in case of accidents. **For example, if a vehicle battery** catches fire, it can be transported quickly and safely from the test bench to a safe location for controlled burning (e.g. RED-BOXX container).

In this case, the test bench is stopped by an emergency stop and the vehicle fixation is automatically separated from the vehicle in a non-destructive manner, without an employee having to enter the test cell. The vehicle can then be pulled out of the test cell with a cable winch, for example.

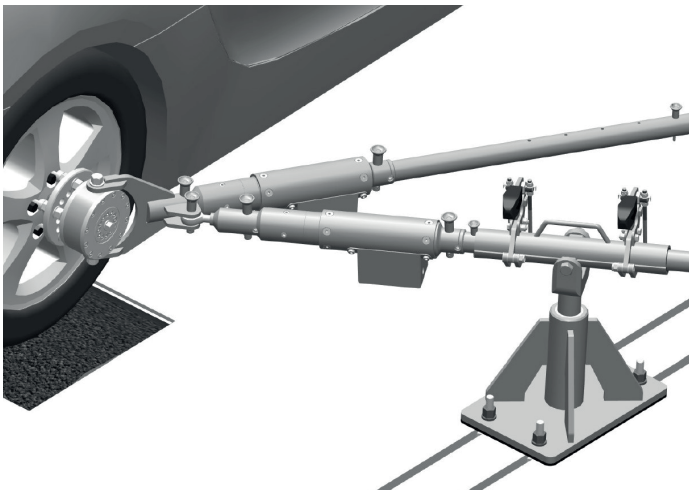
The quick-decoupling element can also be used separately – e.g. in a belt or chain fixation.





Requirements

The wheel hub fixation is configured on both axes in the output direction so that all rods can be pulled apart and split after the decoupling process. It must be possible to set up the configuration according to the figure below. After the decoupling process, only the bearing and fork head remain on the vehicle. The rods and the driving system of the quick decoupling remain in the test bench.

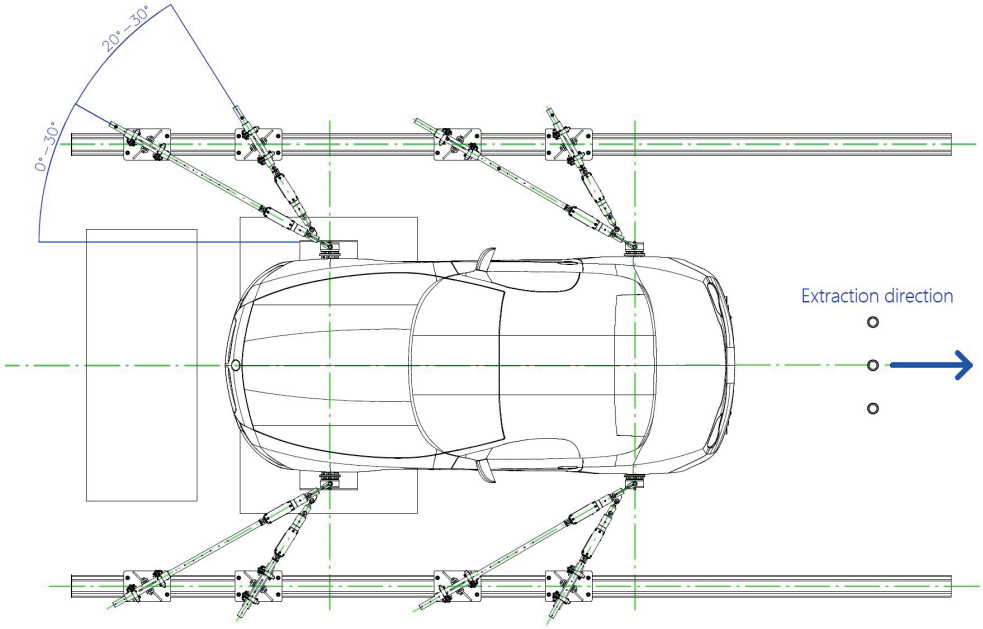


Design and function

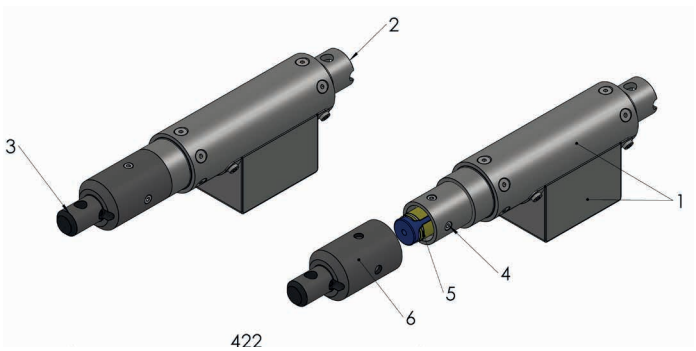
The assembly is the same as the standard wheel hub fixation. The standard rods are replaced by separable variants equipped with a ball lock pin coupling.

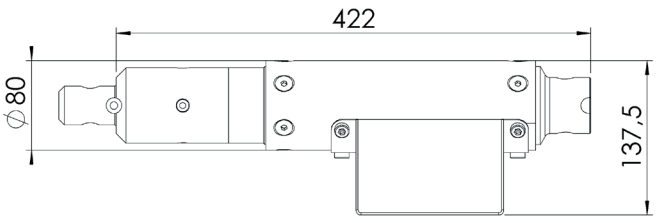
The quick- decoupling element can be installed between the base rod and the rod head.

The standard sliding anchors and plug-in anchors are still compatible and remain in use.



Click here for the video on the function!





[1] Motor housing, [2] Rear interface (here oriented to the wheel hub rod), [3] Front interface (here oriented to the detachable fork head), [4] shear bolts, [5] double wedge mechanism, [6] detached head

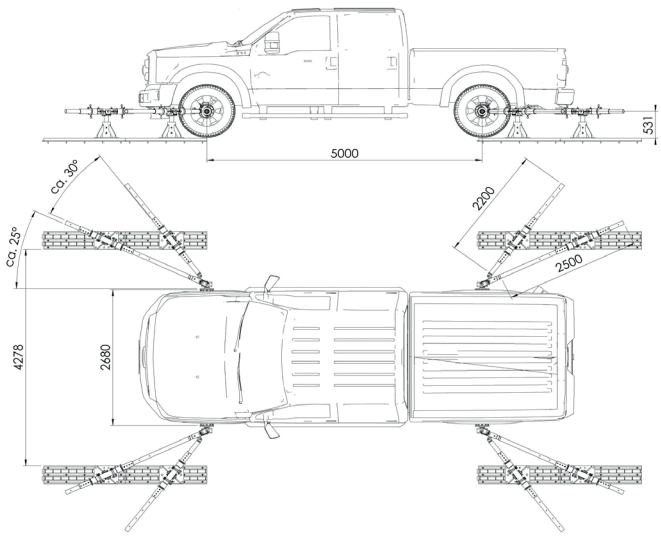
WHEEL HUB FIXATION
MDV 3.5–7.5 TONNES

Wheel hub fixation for vehicles over 3.5t to 7.5t

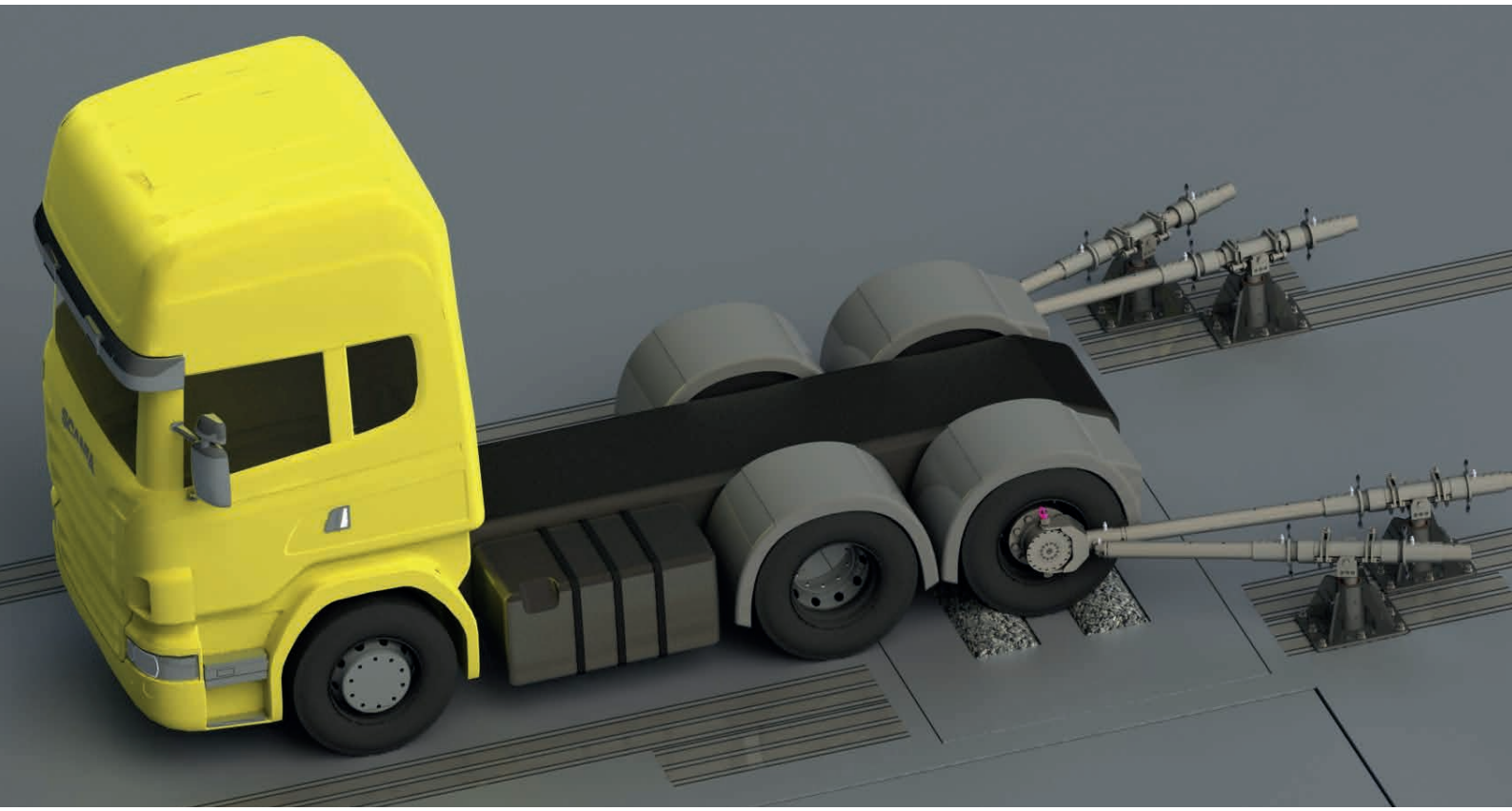
This variant is a further development of the proven system for cars.
The connection is made via the rim on the wheel hub. The wheel bolts/nuts are successively replaced by thread adapters and a rim adapter is mounted. The vehicles are then connected to the test bench safely and without play using fixation bearings, rod triangles and sliding anchors.

Due to the partly larger offset of the rims, there are additional adaptations, so that, for example, a fixation is possible, especially with twin tyres.
This type of fixation makes it possible to run all test cycles and test scenarios, and can be used for all vehicle types in this weight class.

Target group: Commercial vehicles, SUVs and pickups up to 7.5t gross vehicle weight.



WHEEL HUB FIXATION
TRUCKS UP TO 40 TONNES



Wheel hub fixation for vehicles up to 40t
Max. permissible axle weight 11t

This variant is a further development of the proven system for cars and is suitable for trucks and commercial vehicles over 7.5 tonnes. With a design for a maximum axle weight of 11t, all common commercial vehicles in Europe are covered.

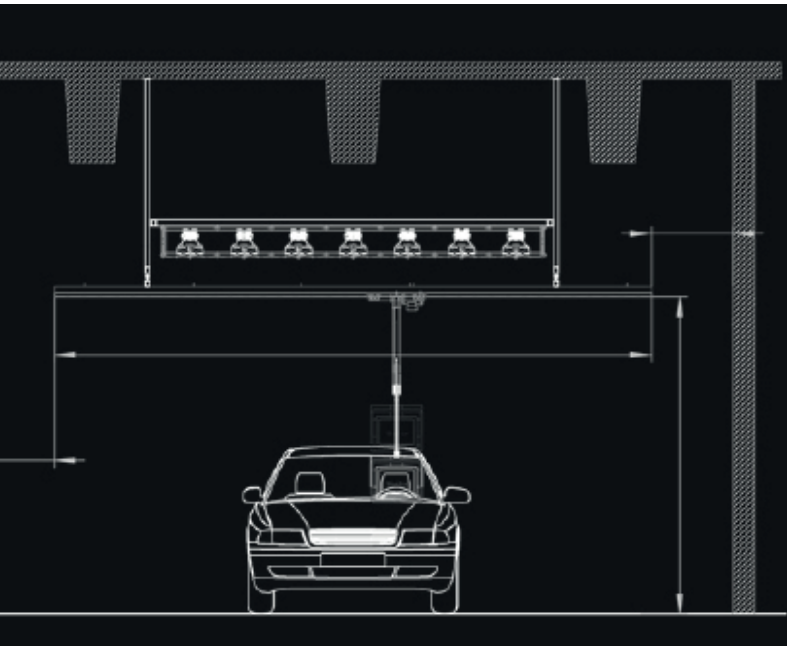
The connection is made via the rim on the wheel hub. The wheel bolts/nuts are successively replaced by thread adapters and a rim adapter is mounted. The vehicles are then connected to the test bench safely and without play using fixation bearings, rod triangles and sliding anchors.

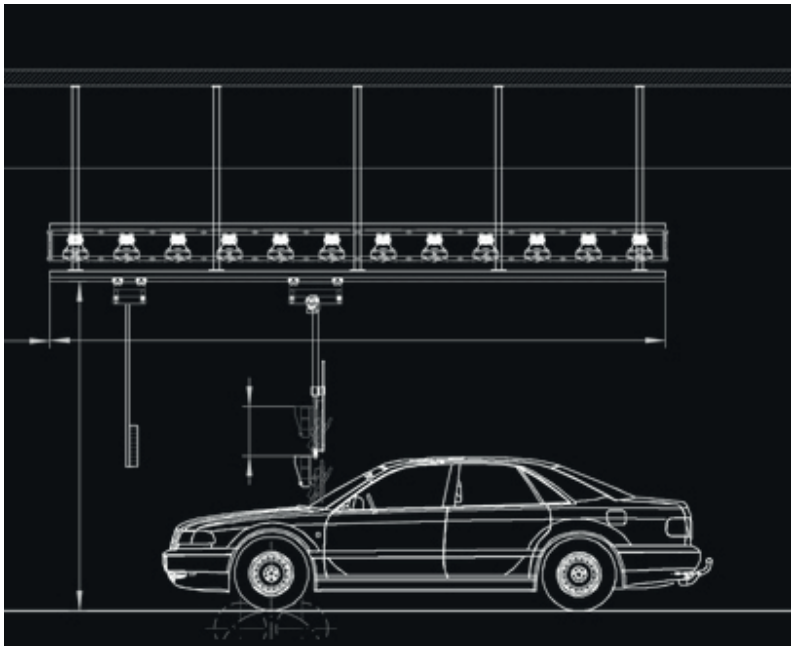
Due to the partly larger offset of the rims, there are additional adaptations, so that, for example, a fixation is possible, especially with twin tyres.

This type of fixation makes it possible to run all test cycles and test scenarios, and can be used for all vehicle types in this weight class.

Target group: Trucks and other commercial vehicles over 7.5t gross vehicle weight.

MONITOR SYSTEMS





Key Facts

- **Purpose:** display of driving cycles and measured values during the test drive.
- **Principle:** flat screen monitor and control units that can be moved anywhere in the room and can be expanded in many ways.
- **Design:** longitudinal rails (x-axis, front/rear), cross slide (y-axis, right/left), vertical lifting device (z-axis, up/down)
- **Test bench:** roller dynamometer, exhaust gas test, endurance test, open air, acoustic test stand, belt dynamometer, climatic chamber -40°C to +60°C

The main elements of a moveable monitor system are shown in the side and front view. The dimensions marked with arrows depend entirely on your needs and the conditions in your test cell.
Our monitor system can be used on a wide variety of test benches, as described on the following pages.

Longitudinal rails and cross slides

The longitudinal rails are attached to the ceiling of the test cell so that they do not vibrate. The entire monitor system can be moved along the longitudinal rails in the x direction. The cross slide can be moved along the y-axis. The entire system can be locked in any position using pneumatic brakes.

Vehicle change

The uncomplicated three-dimensional degree of freedom of the monitor system makes it possible to move the cross slide out of the vehicle's way to the right, left or forward. As a result, the route of the tested vehicle is free and it can be easily removed and replaced with another vehicle.

This easy-to-use procedure for exchanging vehicles is already taken into account when dimensioning the width of the car travel route.

MONITOR SYSTEMS

Functionality of a monitor system

The moveable monitor system is also known under the names “XY-Rail” and “driver control system”.

The moveable monitor system displays the driving cycles and measured values during a test drive on a roller or flat belt dynamometer. For this purpose, a flat-screen monitor and test bench control units are mounted on rails so that they can be moved in all three spatial directions and can be fixed by means of a pneumatic position fixation. As a result, the monitor system can be used in a variety of ways for left-hand and right-hand drive vehicles, as well as for different wheelbases.

3D mobility

The monitor can be moved steplessly in all three spatial directions:

Longitudinal rails (x-axis, front/rear)
Cross slide (y-axis, right/left)
Vertical lifting device (z-axis, up/down)

Locations of use

You can use the moveable monitor system under very different conditions.

Examples are:

- Wheels and flat band dynamometers
- Emission tests
- Performance and braking tests
- Endurance tests
- Outdoor terrain tests
- Climate chambers (-40°C to +60°C)
- Acoustic test benches
- Clean rooms

Individually customizable

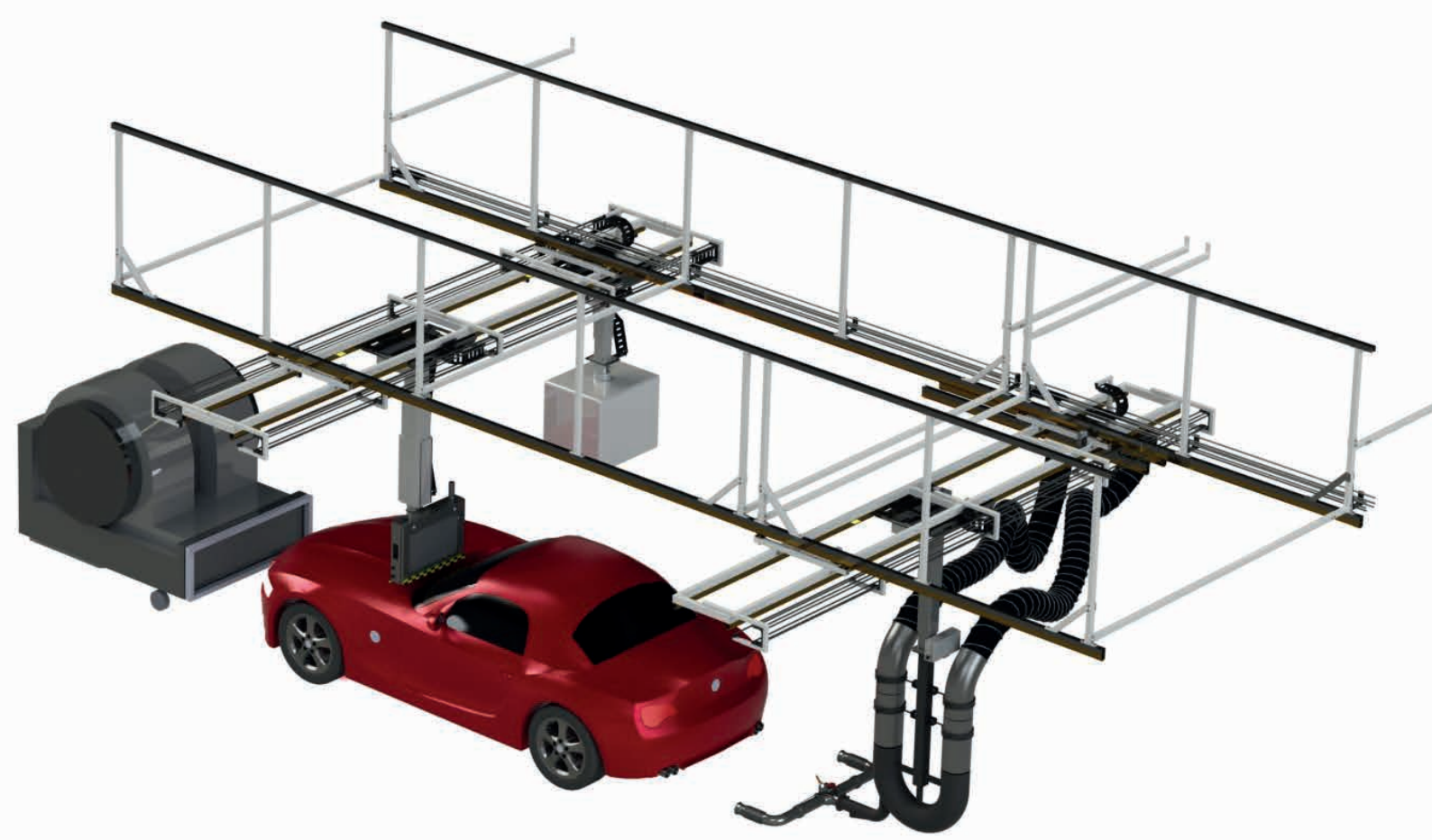
The following dimensions can be individually adapted to your test cell and your needs:

– Travel length: Length of the longitudinal rails
– Travel width: Length of the cross rails
– Travel height of the vertical lifting device

The monitor carrier is also designed according to your requirements. Select from the following components:

– Suspension devices for remote controls and emergency stop
– Brake for x- and y-axis
– Option for later extensions (e.g. additional cables, remote controls, sun simulation)

Our monitoring system also offers the option of integrating the Mixing T as well as other measuring units and also, like the other component, steplessly moving in all directions.



EXHAUST TECHNOLOGY

EXHAUST TECHNOLOGY

Exhaust gas routing: fast, clean and ingenious

– Complete test bench setups
– Muffler adapters for all vehicle types
– Various tailpipe shapes, from simple single pipes to specially shaped tailpipe adapters
– Merging "Duplex exhaust systems" with our "Elk antlers" product
– Pipes and technological means for further discharge into the measuring system or exhaust suction system
– Special adaptations according to your needs and specifications
– Seals for all vehicle types
– Heating of the hoses (WLTP compliant)
– Special attachments for PEMS and adaptations to tunnel measuring sections
– Further accessories upon request

Exhaust technology

S. Bleyer GmbH manufactures and assembles e.g. exhaust gas routing and associated measuring technology, as well as quality and certification test benches. This includes CVS piping and all components around the dilution tunnel on engine and roller dynamometers. The systems are designed and all the necessary components are produced in cooperation with test bench operators. This is followed by a professional mounting.

Development process

To develop the adapters, we use modern technologies, such as 3D CAD and 3D printing.

1. We are provided with CAD data for the exhaust system of the desired vehicle.
2. The adapter is designed and adapted by us in CAD.
3. To test the prototype, we are able to produce a 3D print of the CAD model to check the fit and clamping force.

Exhaust tailpipe adapter

For the direct and preferably exhaust-tight extraction of the exhaust gases on the test bench. Depending on the requirements of the tests and the possibilities of the vehicle, there are various types and designs.

System adaptations and special connections Connection pieces and pliers

Manufacturers and service providers use a wide variety of systems to join and connect the different exhaust gas routing elements, such as Camlock, EPA, Marman, S. Bleyer, and other systems. We supply all of our components in all available flange shapes and also create adaptations between all the available connection systems.

We also offer our own system that combines various advantages
– Easy mounting and disassembly with clamping pliers or a clamping ring
– Integrated, captive high-temperature seal
– Completely gas-tight
– All common diameters available, from 2" to 5"

"Elk antlers" 2-in-1 connection

For merging duplex exhaust systems. Steplessly adjustable and available in various versions.

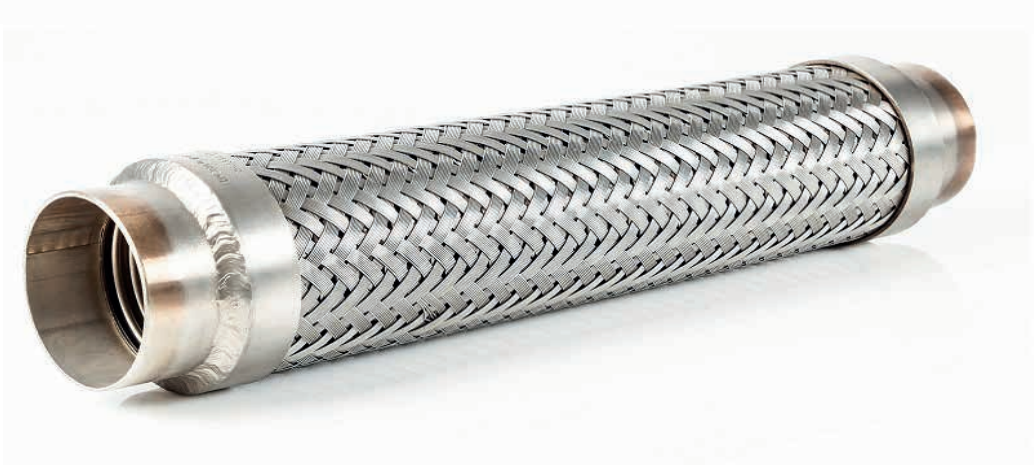
Compensators

Flexible piping elements in various versions.

Exhaust hoses and discharge

We use two different hoses for exhaust gas routing. The stainless-steel corrugated ring hoses are available in various versions, with and without adapter spigots.

Also in the range are standard fabric hoses. These are suitable for a temperature range of up to 650°C and are available in different versions, with and without adapter sockets.



Accessories

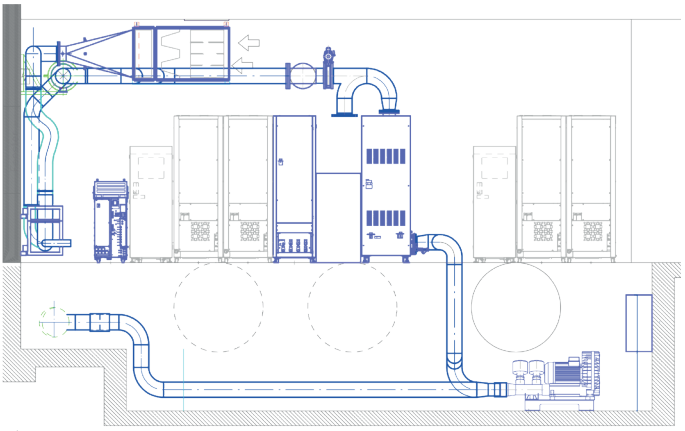
Sealing plug with valve connection

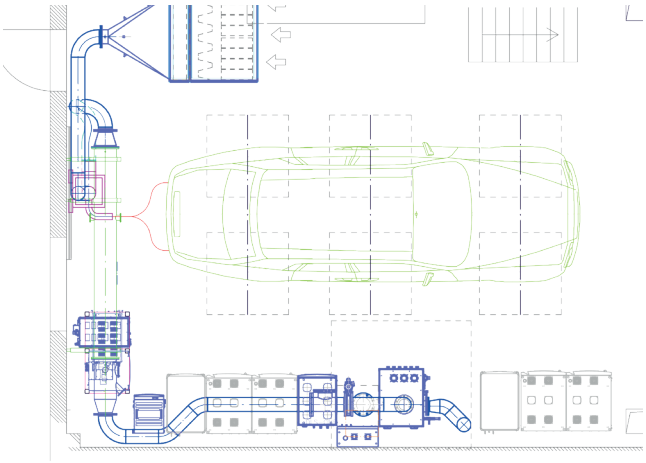
Sealing plug with valve connection for the pressure-tight closure of round pipes

TUNNEL PIPING

We offer a complete connection from the vehicle to the measuring system. In addition to the described components of the tail pipe adaptation, the merging and the flexible piping, this also includes the rigid measurement tunnel piping. This encompasses the complete connection between vehicle and measurement technology, as well as the further gas connection to the extraction blower and stack connection.

We also offer changes, modernisations and test bench specific design adaptations.



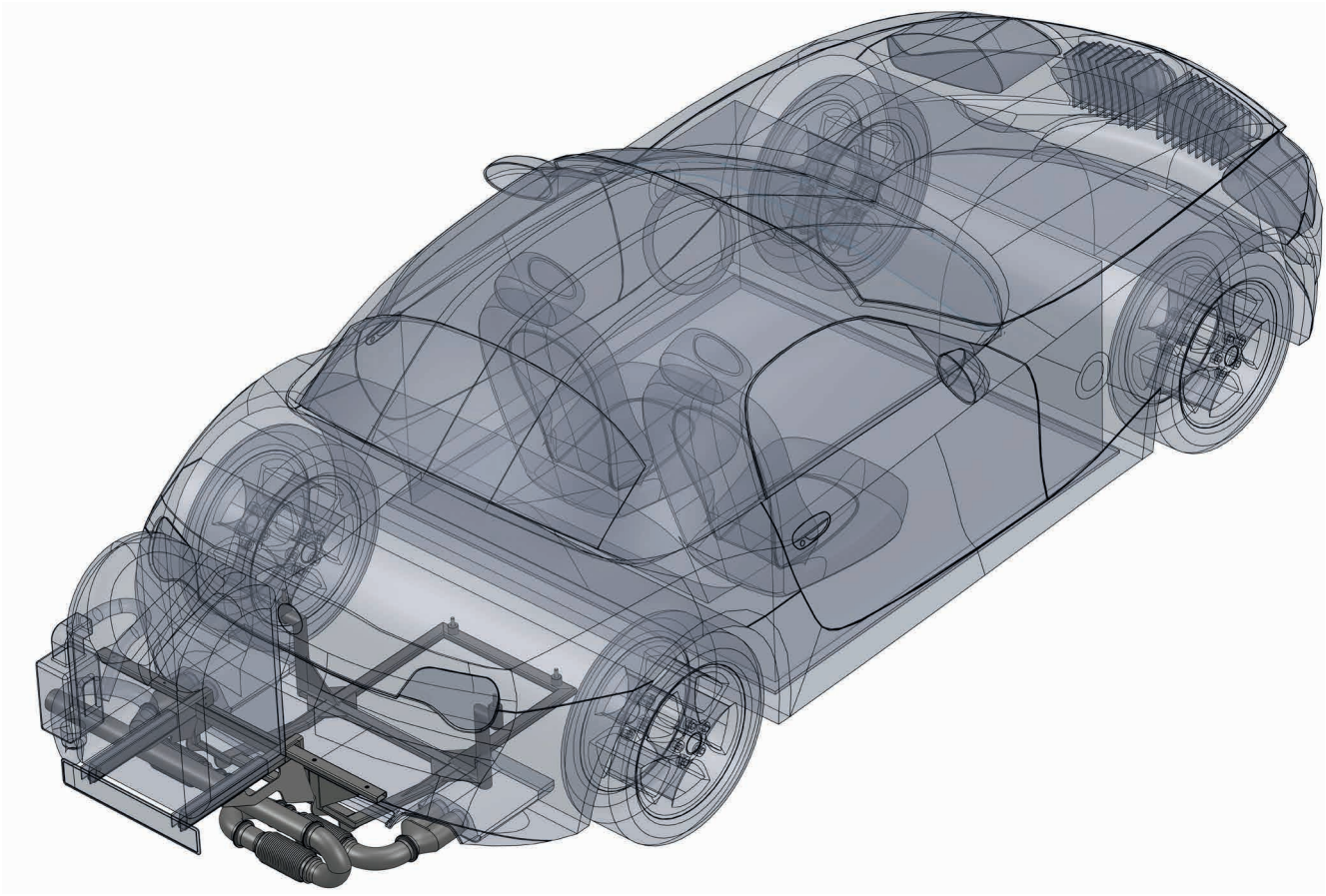


PEMS ADAPTATIONS
FOR REAL DRIVE EMISSION (RDE)

“And then, the measurement results on the road should actually match those from the roller dynamometer; how is that possible?” We take care of it!

The determination of the real drive emission (RDE) requires carrying the entire measurement technology on the road. We design and manufacture individual EFM pipes and PEMS frames in accordance with traffic regulations just behind the vehicle or as a trunk variant for all RDE cycles of all OEMs. This component ensures that the exhaust emission measurements can also be determined in a real environment. An innovation had to be created especially for sports cars, as they do not have a trailer coupling as standard. We have developed frames that are attached to the underbody and can thus carry the entire measurement technology behind the vehicle.

Very fast mounted, technically sophisticated and well suited for the handling of sensitive customer vehicles.

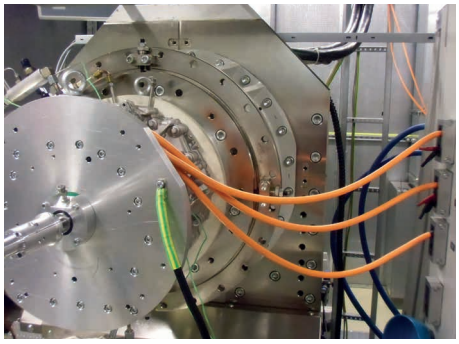
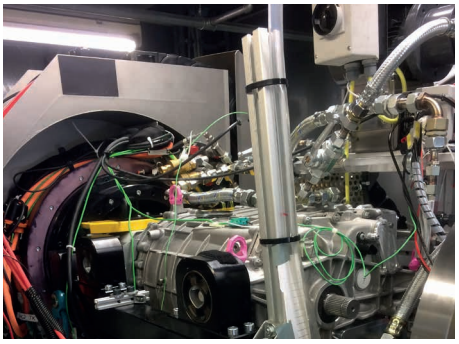
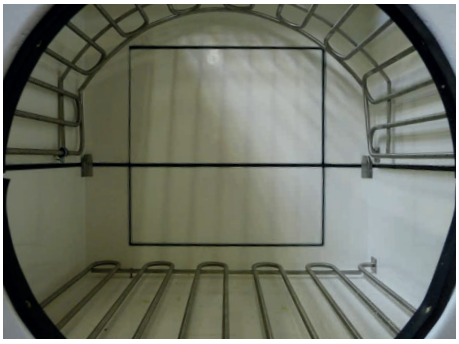
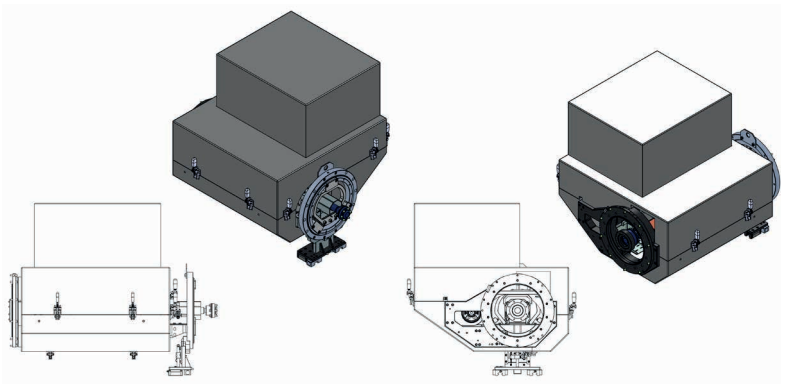
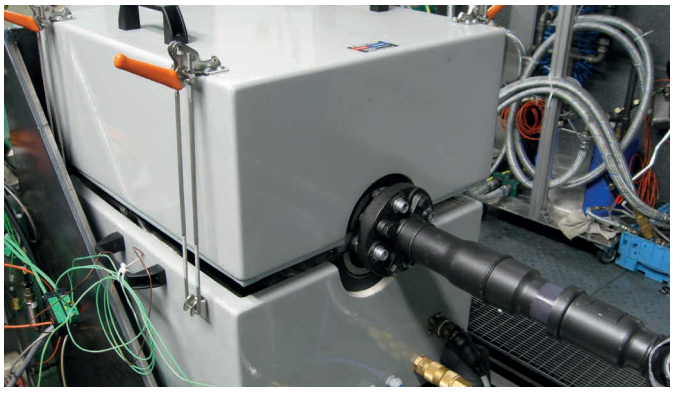


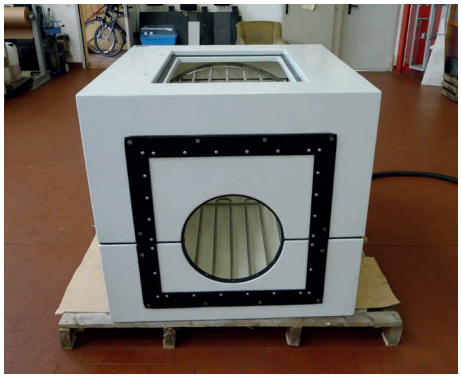
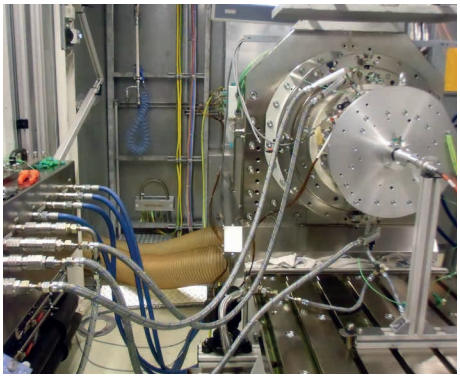
CLIMATE HOUSING
OF PARTS RELEVANT FOR TESTING

Adapted to custom-designed requirements

Special fabrications for component test benches are required regularly.
Particularly when individual components in development are to be subjected to extreme conditions (e.g. cold or heat) for testing, but not the test bench itself.

For this purpose, we design and manufacture special housings, including glass fibre reinforced plastic (fibreglass), ceramic fiber products (CEF) and insulation panels, which meet customer requirements. During development, we can work with CAD data, or design a sample or prototype on site. Further adaptations and requirements such as the installation of measurement technology and other equipment, as well as the integration of pipes for various media such as oil, cooling water, but also for heating and cooling (partly with liquid nitrogen), are also part of our portfolio.

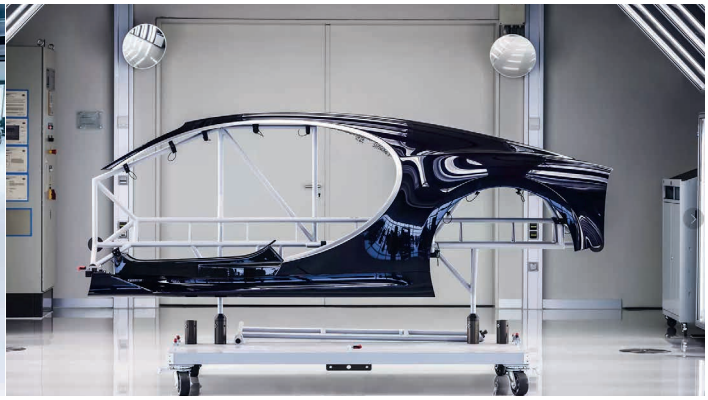
SPECIAL PROJECTS
CUSTOM-DESIGNED SOLUTIONS

MOUNTING RACKS FOR BUGATTI CHIRON

No Bugatti CHIRON would be on the road without our help!

The CHIRON is the strongest, fastest and most exclusive supercar in Bugatti history.
For the individual production of each Bugatti CHIRON, all production and mounting modules for "the studio" in the Molsheim manufactory have been developed, manufactured, commissioned and perfected according to the very high demands of Bugatti.
In order to optimise individual designs, we have integrated electronic components, motors, sensors and adjustable pneumatics into the respective devices. These devices include, for example, a workstation with lifting and swivel function, work transport aid and frames for pre-assembly, mounting and final assembly.
These manufacturing and mounting frames allow employees to manually assemble all 1,800 single parts with little effort.

And all of this is entirely the responsibility of our company.



FAN ROTORS
ENGINE REVISION

This new, patented revision procedure was presented at CAWA 2022 in Nantes (France).

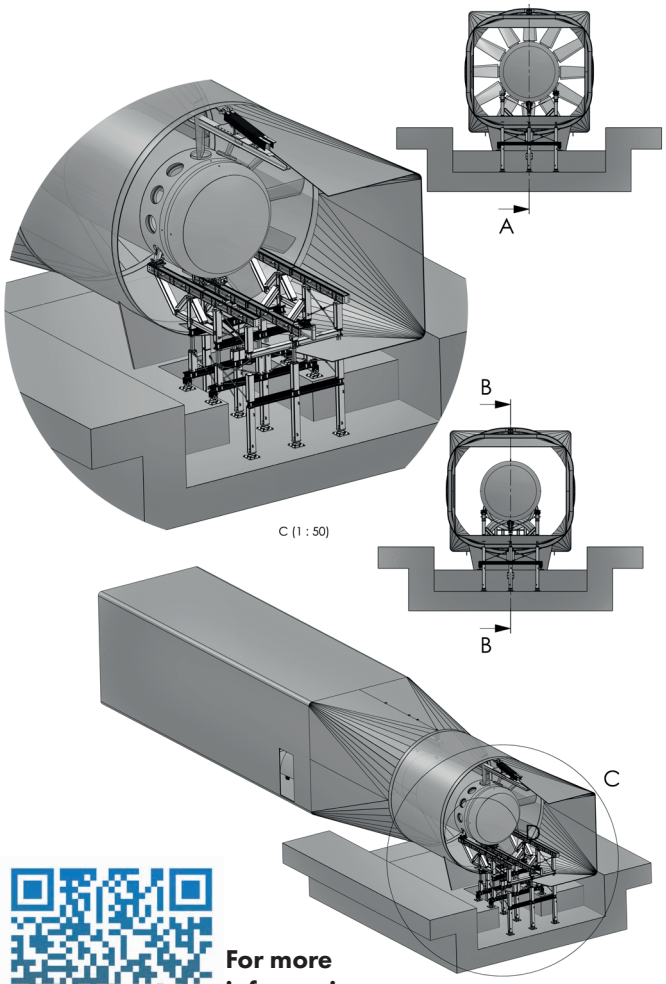
Revision of fans in wind tunnels on site

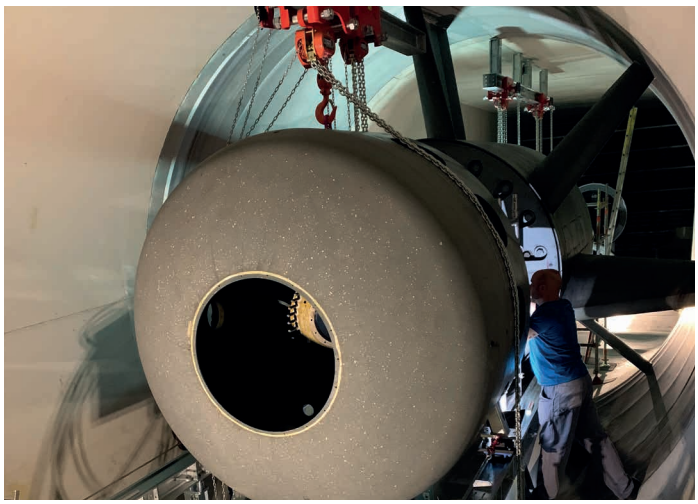
The rotors of wind tunnels must be revised approximately every 10 years. This should also include a bearing change, among other things. The conventional method of fan rotor removal in wind tunnels involves the opening of the building roof in order to lift the complete rotor through the opening with a crane. After work on the fan is completed (usually in an external workshop), the fan is re-installed via the same opening – the same procedure as during the initial assembly.

S. Bleyer GmbH (Germany) and its partner Wenger Lüftungstechnik GmbH (Austria) have developed and already implemented a method to revise fans in wind tunnels without having to open the tunnel in a classic way, remove the fan through the open roof of the plant, bring the fan to a workshop, refit the engine, and reinstall it.

This process has been patented by S. Bleyer GmbH and Wenger Lüftungstechnik GmbH with the number 10 2019 107 610.

In cooperation with our partner Wenger Lüftungstechnik GmbH, we also offer maintenance tasks such as bearing lubrication, bearing condition diagnosis, electrical measurement and, in particular, crack detection on rotor blades.





For more information please visit our website

FROM THE VILLAGE HOBBIST

Europa

TO WORLD MARKET LEADER

Asien

Nord- und Südamerika

Partners include

in the UK
Hatton Systems (Sales & Service)
in China
Ultitech (exclusive partner)
in Korea
TeSys (Sales & Service)

Customers include

in the USA
Mercedes-Benz USA

KEY

Countries/locations of our components

Our partners (outside the EU)

Your problems
Our solutions

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DE-73614 Schorndorf

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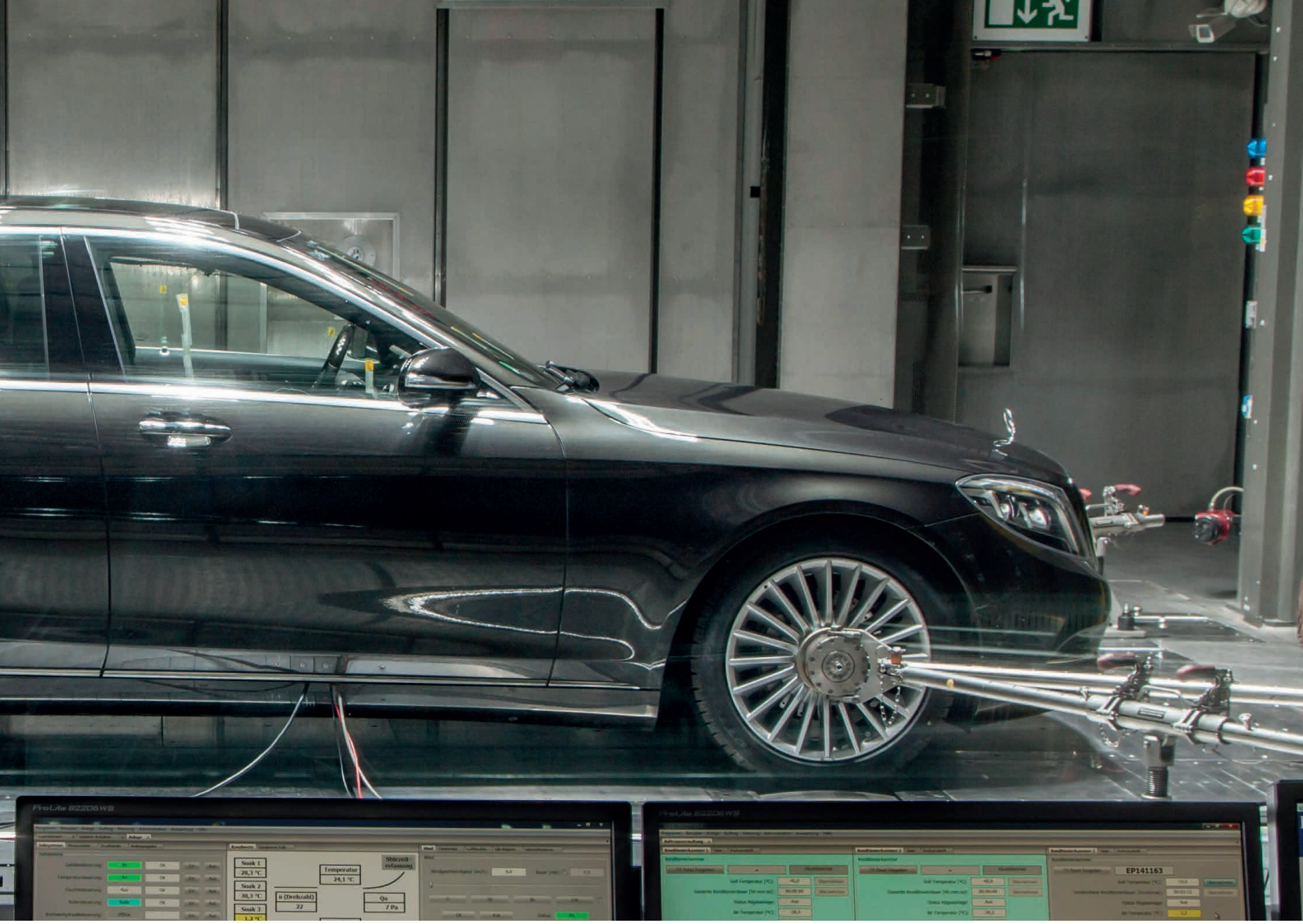

We, S. Bleyer GmbH, are a medium-sized system supplier for automotive testing technology with our headquarters in Schorndorf, in the greater Stuttgart area.

From our foundation in 1996 until today, what was a small metal construction company has now become the market leader in the field of test bench technology. Our range of services is characterised by solution-oriented project planning and the implementation of custom-designed products.

Over time, repeatedly requested solutions have become products that are now an integral part of our portfolio.

Our main business areas, such as vehicle fixation for test benches, monitoring systems and exhaust technology, also include special projects, such as expansion silencers, fan revisions in wind tunnels, drive and protection solutions, integration of measurement technology and sensors, as well as PEMS adaptations, and much more, based on individual customer requirements.

We are a holistic partner for all test cell peripherals.

We will find tailor-made solutions for your problems and accompany you from planning and implementation to ongoing operation and maintenance/repairs.

Feel free to contact us!


WONDERFUL
IS WHAT WE ARE AND
WHAT WE DO
S.BLEYER
Audi Zentrum Stuttgart
S. Bleyer GmbH
www.s-bleyer-gmbh.de