



# Service Portfolio for Components

Competence and years of experience.

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## **Comprehensive services. Diverse solutions. Superior performance.**

### **We are your full service provider.**

Scheduled overhauls, repairs after an accident, reconditioning components or modernising your entire fleet – whatever the work involved, we have the skills to do it with a wide range of services that span the entire service life of your vehicles.

### **We maintain high standards and provide excellent workmanship.**

At our locations in Germany, our specialists work together in a network of maintenance depots to coordinate a range of activities. This, in turn, allows us to quickly respond to customer requirements, process orders efficiently with a view to minimising costs, and carry out our work to a high level of quality.

### **We are an organisation rich in tradition.**

The history of our organisation is unique and dates back many decades, with some locations having been in service for more than 150 years. For years, our maintenance depots and the employees who staff them have enjoyed an exceptional reputation across Europe.

### **We offer our services to customers around the world.**

Our customers include operating companies, rolling stock companies and manufacturers of rolling stock and associated componentry. In catering to our customers, we oversee and render all maintenance services.

### **We provide solutions that ensure a long service life.**

Our maintenance programme for components encompasses analysis through to reconditioning services, all of which are tailored to meet your exact needs. To ensure an optimal service life for components, we strictly adhere to the specifications of our customers and uphold high-quality maintenance standards at all times.

**Learn more about the DB Fahrzeuginstandhaltung service portfolio!**



## Competence in terms of components.

**Rolling stock incorporates a wide variety of components that require varying levels of servicing and maintenance. To this end, we offer maintenance services for all types of rail vehicle componentry fitted to a wide range of rolling stock – from pantographs, to traction motors, through to entire wheelsets.**

Our many years of experience in maintaining the components of common assemblies found in all vehicle classes and categories have allowed us to amass a comprehensive set of skills and knowledge. The exhaustive services portfolio we offer therefore includes machining the components of all manufacturers of drives, bogies, on-board systems, brake systems, control and power electronics, interior fittings as well as hoses and gaskets, among others.

All component maintenance work is performed in strict accordance with the specifications of our customers. In doing so, we leverage our insight when reconditioning components to make the process even more effective. The overarching objective we pursue is to ensure an optimal service life for components so that your rolling stock remains in service for as long as possible, and we do just that by upholding high-quality maintenance standards.

Our broad know-how also allows us to minimise costs by reconditioning almost every part conceivable instead of simply replacing components with more expensive new ones.

We have obtained all relevant certifications, including DIN EN ISO 9001, DIN EN ISO 14001 and DIN EN 15085-2, as well as specific qualification and approval to maintain rail vehicle components. Our maintenance depots are outfitted with the latest in production and testing equipment that meets all technical requirements for reconditioning components.

This gives us the capacity to maintain some 65,000 wheelsets, 165,000 brake system components, 80,000 seats and 20,000 buffers for Deutsche Bahn alone, not to mention the numerous other national and international customers.

Why not find out more about our comprehensive service portfolio for components!

# I. Combustion engines

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1. Diesel engines

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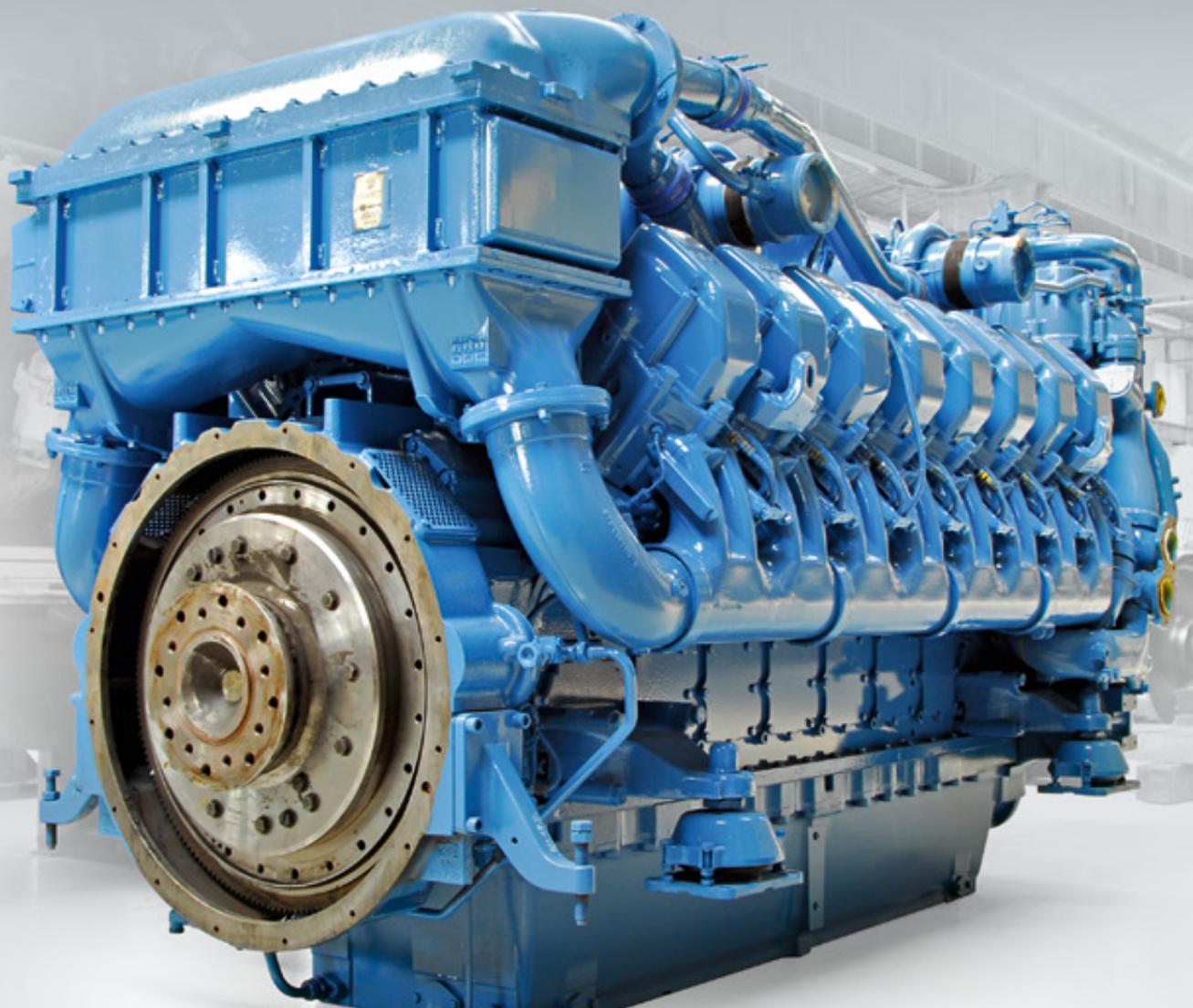
2. Cardan shafts

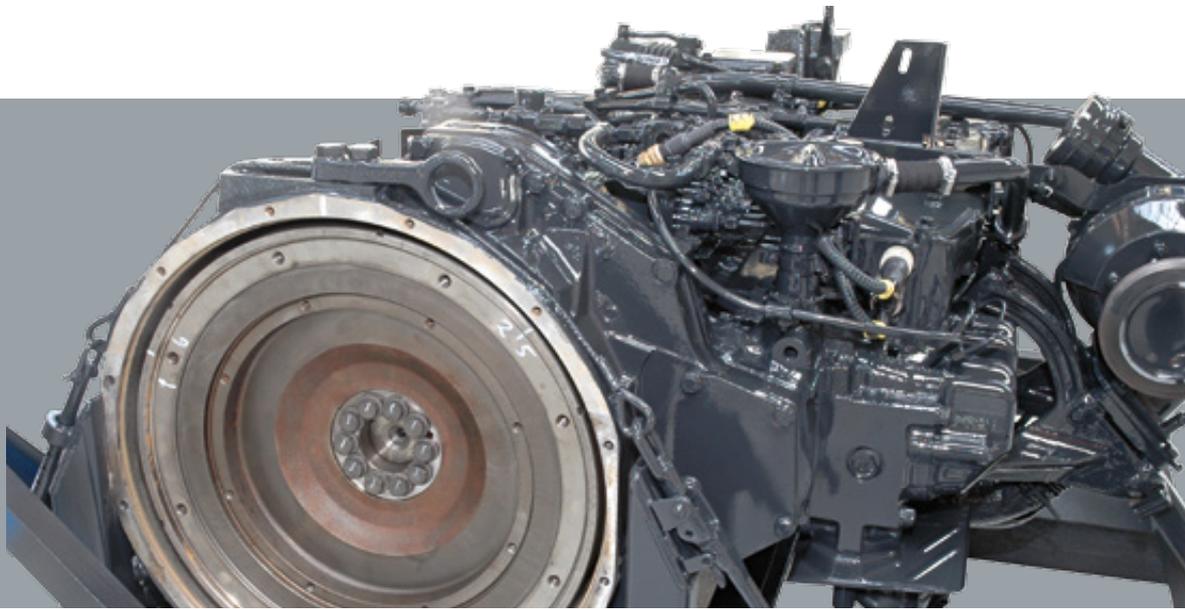
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3. Drive modules

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4. Transmissions





## 1. Diesel engines

**We are your partner for servicing diesel engines, regardless of the manufacturer. Whether it is preventive or corrective maintenance you are looking for, our service programme is based on offering complete packages for maintaining diesel drive systems.**

Our portfolio includes services for heavy-duty engines and engines in diesel railcars with a rated output of 100 to 3,400 kW. Power plants manufactured by reputable companies such as MTU, MAN, CAT, Cummins, Mercedes-Benz, MAK and MWM are just some of the drive systems we maintain.

Every step in overhauling a diesel engine is critical and is linked to an elaborate system of quality assurance checks designed around the standards defined in the relevant testing and quality assessment procedures.

- **Dismantling and cleaning:** The engine is completely dismantled at the start of every overhaul operation. The next step involves thoroughly cleaning the individual parts and components. Careful inspections determine whether damaged components can be professionally repaired and reused or need to be replaced with new components.
- **Cylinder block:** Cylinders exhibit wear and tear in fractions of a millimetre as they are operated. By using precision tools, we recondition these areas to reinstate a perfectly cylindrical, round shape.
- **Cylinder heads:** If our special inspection equipment reveals microscopic cracks in the cylinder heads, the heads are taken out of service as they cannot be fully reconditioned.
- **Crankshaft:** A crankshaft must cope with enormous loads. This is why each shaft is thoroughly cleaned and is subjected to an electromagnetic crack-detection test. Bearing journals are precision ground and polished in line with defined radii, tolerances, repair stages and surface roughness. Finally, the crankshaft is precision balanced to ensure that the engine operates smoothly.

- **Conrods:** Conrods, or connecting rods, are especially scrutinised by our maintenance specialists, who subject them to a full battery of machining operations, which include honing the basic bores, replacing the conrod bushings, verifying component weights and aligning.
- **Camshaft:** The job of the camshaft is to ensure that the valves move with the correct timing. This is why it is rigorously checked. Only if the cams and bearing points can be remachined is the camshaft reused.
- **Ancillary equipment:** Ancillary equipment includes items such as the turbo-charger, the injection, water, fuel delivery, oil and hydraulic pumps as well as the radiator fan and oil cooler. These assemblies are cleaned, inspected and, if required, repaired or replaced. Complex and sensitive assemblies are examined on special test stands.
- **Assembly:** The engine is then reassembled following the strict quality specifications that also apply to the engine manufacturers themselves.
- **Quality and performance test:** Now is the moment of truth, when a performance test is carried out on the dynamometer to verify that all engine functions are within their designated tolerances.



Our level of vertical integration makes us a reliable partner when it comes to working on diesel engines. A dedicated storage facility and an ongoing improvement process also enable servicing times in the maintenance depot to be continually reduced.

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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Bremen has a separate production segment for diesel engines. Seven engine test stands in four cells are available for mechanically and electrically controlled engines.

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### References

Every year, up to 700 light and heavy-duty engines from railway vehicle operators across Europe are serviced and adjusted during a test run.

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### Certification

- Member of “Gütegemeinschaft der Motoreninstandsetzungsbetriebe e.V.”
- Inspection techniques and media employed comply with ISO 4008 and 4113.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
 Werk Bremen  
 Am Wasserturm 10  
 28309 Bremen  
 Germany  
 E-mail: sales-fzi@deutschebahn.com



## 2. Cardan shafts

**We are specialists in reconditioning cardan shafts for all types of vehicle and from all manufacturers, and can handle lengths of up to 3,000 mm.**

Our services include:

- Inspecting shafts for external damage
- Overhauling or replacing universal joint spiders
- Refurbishing the resan coating
- Carrying out mechanical rework, including adjustment
- Conducting an ultrasonic test of the weld seams (if required)
- Taking bending and torsional play measurements
- Mounting, including adjustment of axial play
- Performing concentricity tests
- Dynamically balancing the shafts
- Drafting a balancing report
- Applying paint



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### Infrastructure

State-of-the-art production equipment, balancers and testing facilities are on hand to repair a wide range of drive systems. The rotational speed of our computer-controlled balancing benches can climb as high as 3,600 rpm to balance out unit weights of up to 1,000 kg.

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### 3. Drive modules

**We are your cross-manufacturer specialist for reconditioning drive modules for diesel/gas railcars from well-known manufacturers such as MTU, MAN and Cummins.**

All components are first inspected for any signs of damage after being dismantled. If extensive or recurring damage is detected, we can conduct a cause analysis for you.

- **Quality check:** A quality check is carried out before components are reconditioned. To this end, we use gentle, non-destructive processes when inspecting conrods and crankshafts, for example.
- **Component reconditioning:** We follow a multi-step sequence to recondition crankcases, crankshafts and other expensive components and repair them, if required.
- **Test run and painting:** Our state-of-the-art test stands are used to verify the performance of the engine and drive module under different load conditions. Finally, the drive module is repainted to protect it from the elements.

We can also offer partial reconditioning services that are tailored to your specific needs.



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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Bremen has a separate production segment for drive modules. State-of-the-art production equipment, balancers and testing facilities are on hand to repair a wide range of drive systems.

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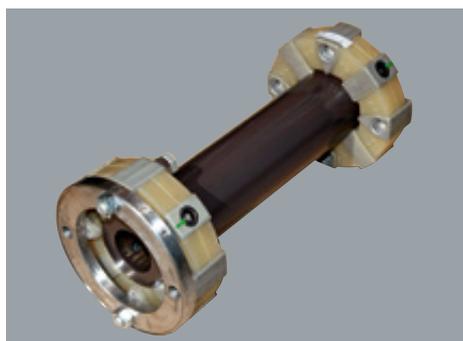
### Certification

- Member of “Gütegemeinschaft der Motoreninstandsetzungsbetriebe e.V.”
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## 4. Transmissions

**Our maintenance programme includes servicing transmissions in accordance with valid technical specifications and breaks down into the following three maintenance categories:**

- Assessment of actual condition, scheduled work and test stand trial run
- On-demand repairs if actual damage is discovered
- Main inspection (full-scale reconditioning) with test stand trial run and painting

You profit from the consolidated know-how of our specialists in the production competence centre for transmissions and springs at the DB Fahrzeuginstandhaltung maintenance depot in Dessau. The services offered feature reconditioning and maintaining all common traction gears used in diesel/gas railcars and diesel locomotives, including:

- Hydraulic transmissions from manufacturers Voith, SM in Dresden and ZF in Friedrichshafen
- Manual transmissions from manufacturers Gmeinder, MAK and Getriebewerk Penig

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### **Infrastructure**

By leveraging our specialised knowledge, modern systems and production processes, we can offer you competent services you can count on.

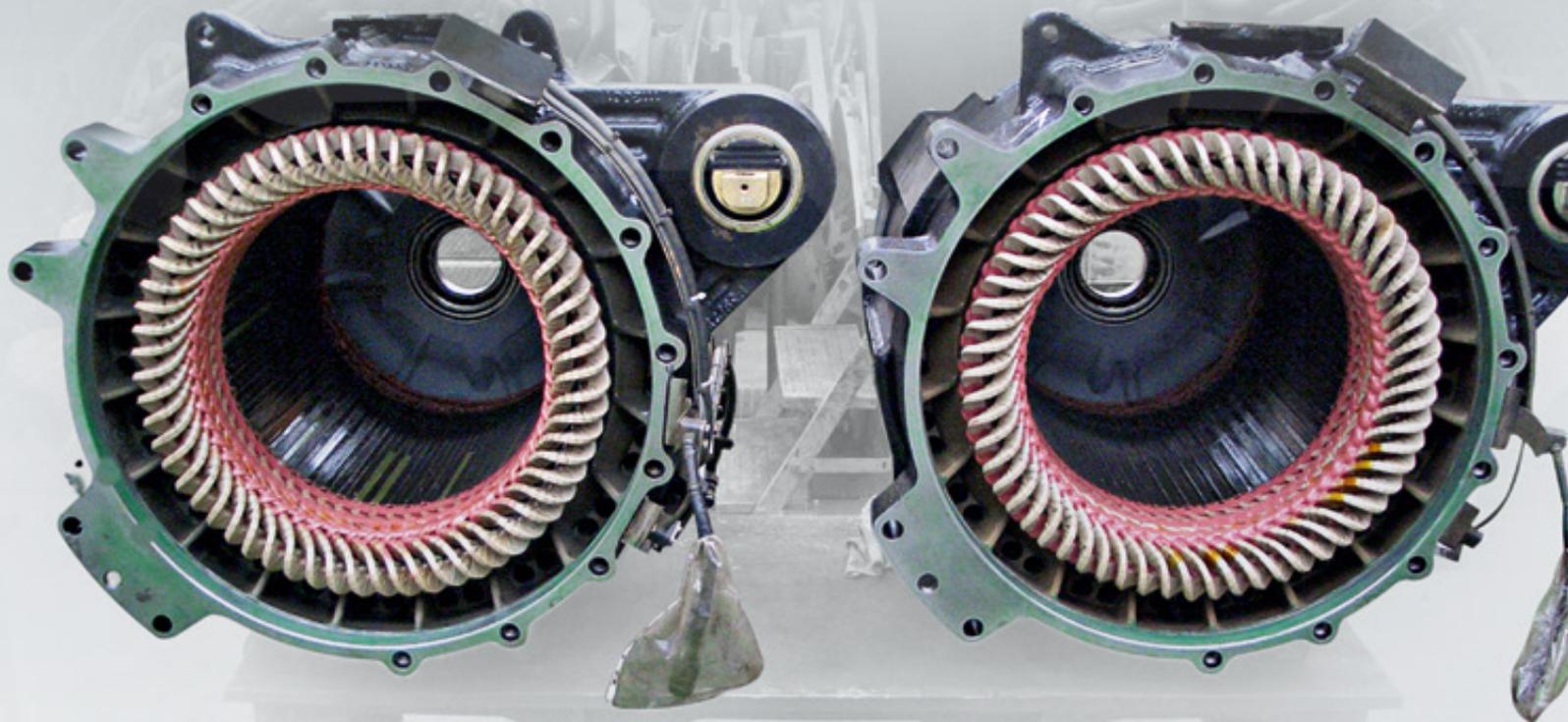
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### **Contact**

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# II. Electric drives

1. Traction motors
2. Pantographs
3. Switchgears and band resistors
4. Traction electronics
5. Control electronics for electric drives
6. Transformers/inductors
7. Main circuit breakers



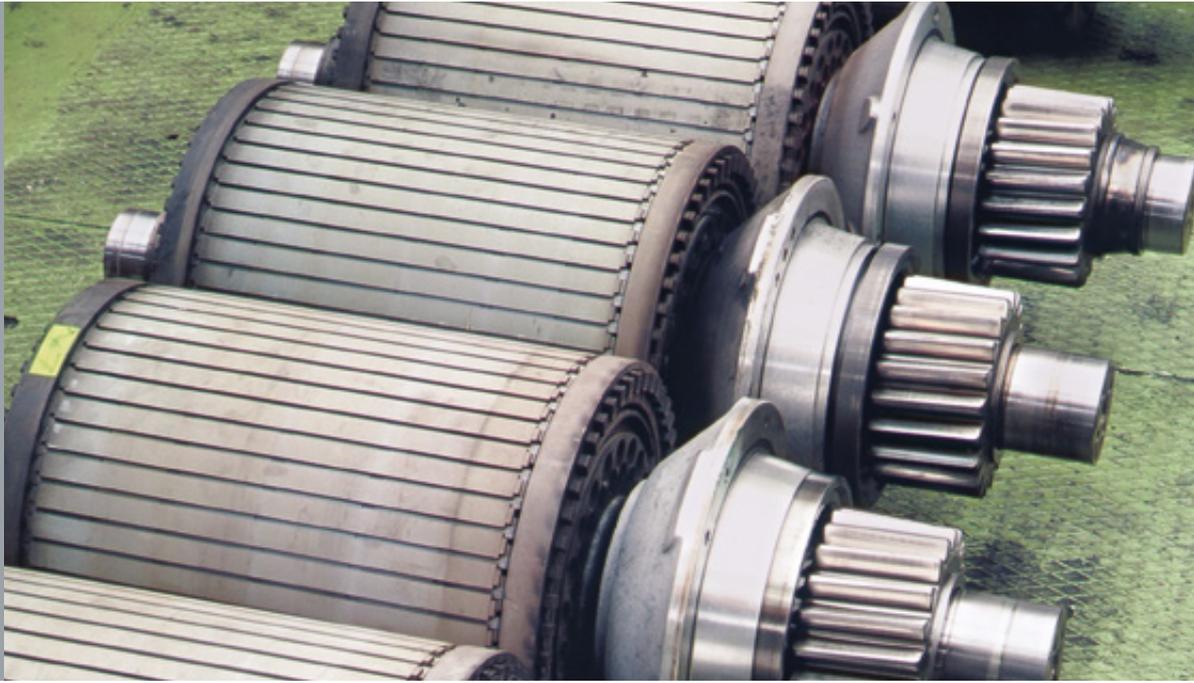


## 1. Traction motors

**We are the experts in traction motors. All components and materials used are inspected and assessed individually and in accordance with customer requirements. This approach allows all components to be reconditioned and repaired based on their dismantled condition.**

Our portfolio includes three-phase motors with solid-state coils in different configurations and power categories as well as single-phase series-wound motors of older designs. We can also maintain traction motors used in high-speed trains.

We offer a full-service package including consultation and qualified accident assessment through to completion of the work – all of which is tailored to your specific needs and comes from a single source. In addition to an optimal infrastructure with the latest in equipment and process technology, competent and experienced employees are always available to handle a wide range of maintenance activities. Not only do we have the technology required to overhaul traction motors, but have also acquired valuable skills in carrying out heavy maintenance that involves new solid-state coil windings and new magnetic laminated cores. Full restorations are also possible, whereby the assembly can be transitioned from the prototype stage to routine operation using a new insulating system and testing techniques.



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### **Infrastructure**

The DB Fahrzeuginstandhaltung maintenance depot in Dessau offers the following systems and equipment for repairing traction motors:

- Washing facilities for traction motor stands and traction motor rotors
- Vacuum drying ovens
- Inductive remover for stator laminated cores from single-phase series-wound motors
- Commutator undercutting machines
- Rotor balancing bench
- Vacuum pressure impregnation system with drying oven
- Thermal paint stripping oven
- Dual-chamber test area for carrying out qualified functional tests on traction motors

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## 2. Pantographs

**We are the experts in repairing pantographs for electric traction units.**

Our portfolio encompasses pantographs found in a wide range of power system configurations, including 15 kV/16.7 Hz AC, 25 kV/50 Hz AC, 1.5 kV DC and 3.0 kV DC. Maintenance and repair work is carried out on different pantograph types and designs offered by the manufacturers MELECS, Richard AG, Schunk and Stemann.

We can also recondition pantographs in three separate stages, depending on the condition of the assembly:

- Stage 0: Replacement of the power connectors, wire cables, carbon brushes, main bearing, hoist and bellows drives, and minor rocker repair
- Stage 1: Stage 0 services plus replacement of the upper arm, touch-up of the corrosion protection and full-service rocker repair
- Stage 2: Stage 1 services plus application of corrosion protection over an extensive area, replacement of the base frame and underarm, and full restoration of the lowering device

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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau has its own workshop for repairing and inspecting pantographs, where a total of six reconditioning and test stand units are used.

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### References

Every year, up to 750 pantographs of different types and designs are repaired and subjected to a final inspection.

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### 3. Switchgears and band resistors

We have amassed decades of experience in maintaining switchgear and band resistor componentry.

This includes contactors, disconnectors, reversing units, master controllers/brake pad adjusters and braking resistors. All components are maintained and serviced in the following order:

- Dismantle
- Clean (e. g. wash, blast)
- Inspect (for function, switching times, switching sequences, contact pressures, spring forces, contact resistance, high voltage, insulation)
- Repair

We can also perform conversion or modification work based on customer requirements and fabricate new switchgear that is no longer available from the OEM.

You can place your trust in a reliable partner who is well-versed in all aspects of electromechanical switchgear. Our broad service portfolio, which includes over 200 different components and a high volume of reconditioned parts, also minimises costs.

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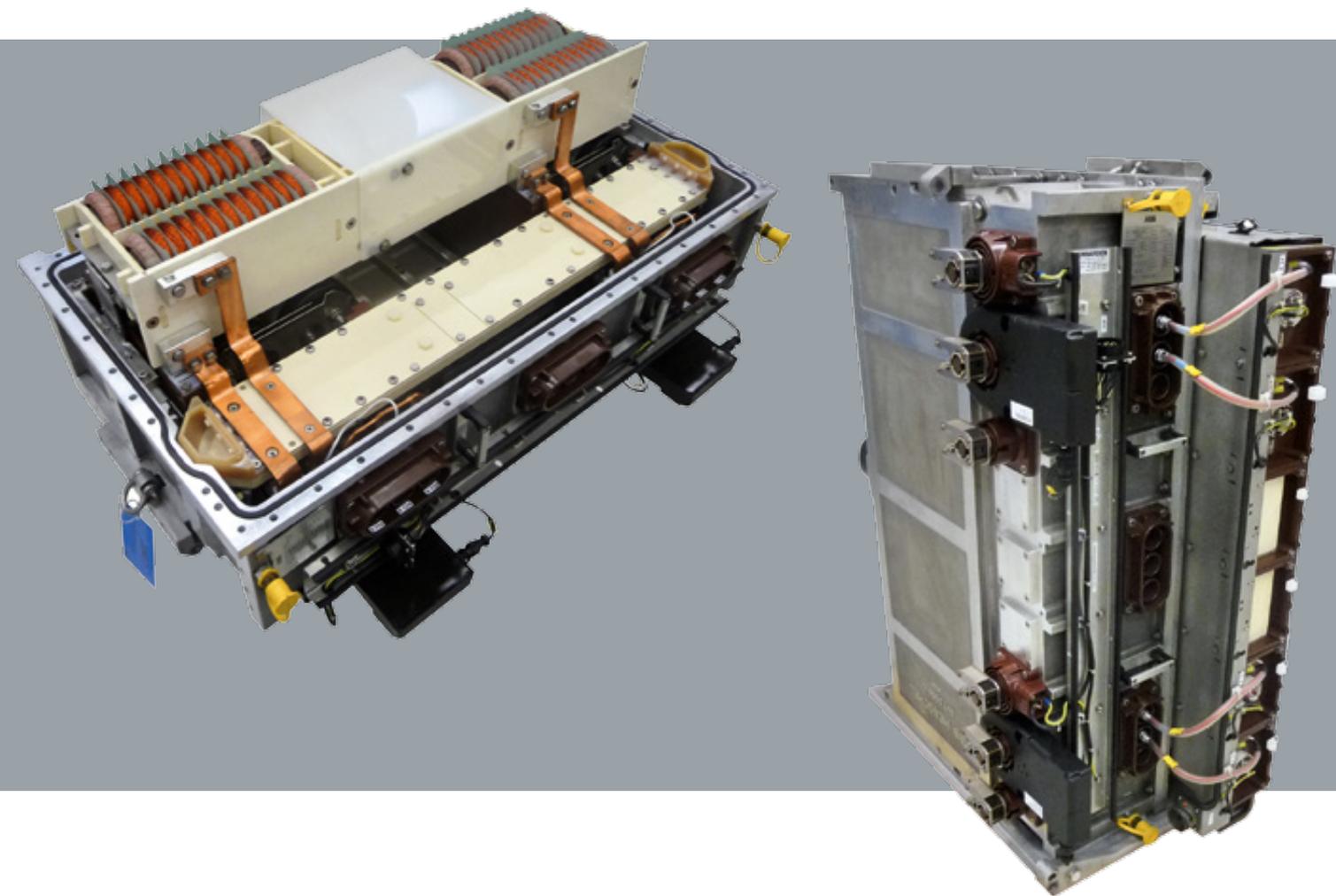
#### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau uses state-of-the-art inspection techniques, cleaning equipment and a blasting facility to maintain and service components.

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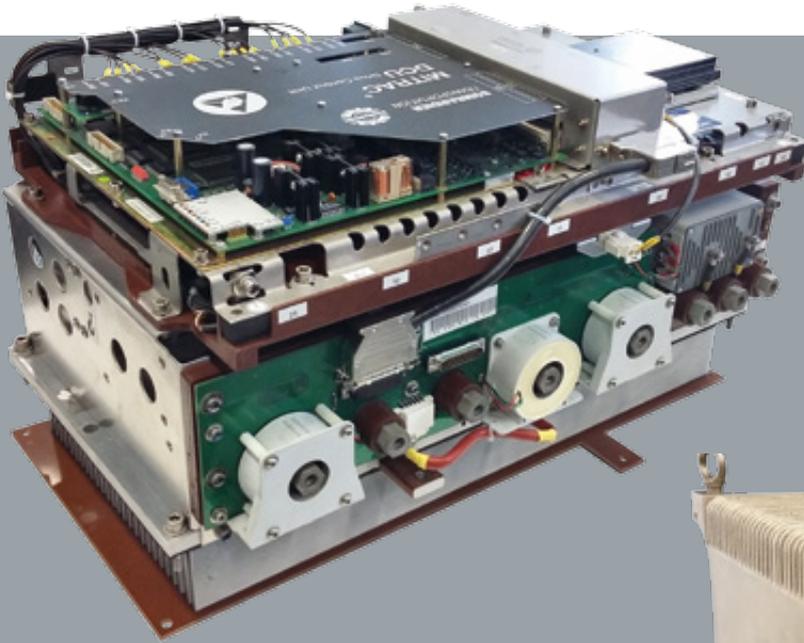
## 4. Traction electronics

We offer a maintenance and repair programme for GTO and IGBT traction electronic components. This includes battery chargers, inverters as well as converter and auxiliary converter modules manufactured by ABB, Alstom, Bombardier and Siemens.

While in the past the demand was mainly for repairs, today's demand is increasingly for refurbishments. This includes preventive measures that ensure troublefree operation over the years to come:

- Replacing sealing components
- Applying new heat-conducting paste
- Replacing obsolete components or upgrading to latest components





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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau uses the following equipment to maintain traction electronic components:

- ESD-compliant workstations
- PC-controlled functional test systems
- Test facilities for IGBT and GTO inverter modules (3,750 V/2,000 A)
- Cleaning systems for electronic components
- Networked PC workstations for the maintenance process
- Component and repair database
- Quality management in accordance with ISO 9001:2008 and ISO 14001:2004
- ECM conformity in accordance with EU regulation 445/2011 for Function IV and Function I

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### References

Every year we repair some 3,000 traction electronic components for a multitude of customers from the railway industry. We are constantly expanding our portfolio to the benefit of our customers.

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## 5. Control electronics for electric drives

We are the specialists in maintaining control electronics components for electric drives.

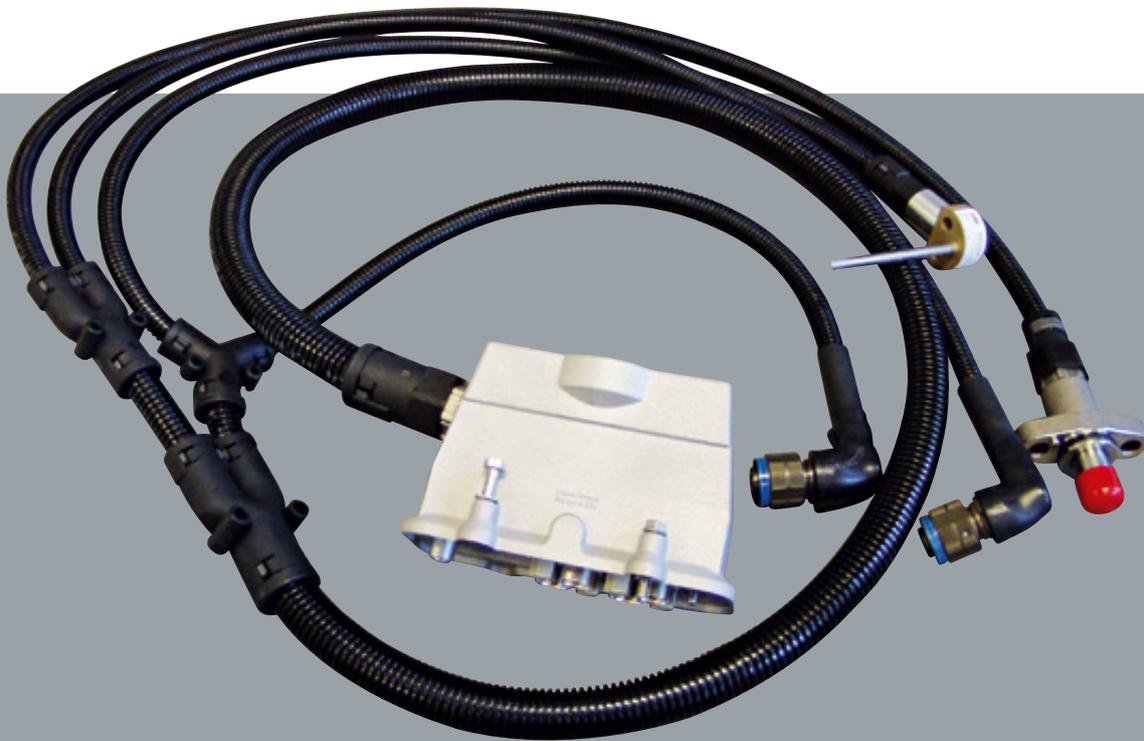
These include:

- Modular driver's cab indicators
- Pressure gauges/driver's cab instruments
- Cable production
- Master controllers/switch plates with CAN bus connection
- Microphones
- PCB production (in limited numbers for conversions, rolling cams, etc.)
- GMR

These components are maintained in several steps:

- Disassemble
- Clean (and wash, if necessary)
- Acquire documentation
- Perform functional test
- Identifying and acquiring material(s)
- Repair
- Carry out endurance test
- Inspect and approve

Our level of vertical integration makes us a reliable partner when it comes to working on control electronics. A dedicated storage facility and an ongoing improvement process also enable servicing times in the maintenance depot to be continually reduced.



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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau uses the following equipment to maintain control electronics components:

- ESD-compliant workstations
- PC-controlled functional test systems
- Simulation environments
- Programming devices for memory modules
- Soldering station for PCBs that utilise SMD technology
- Cleaning systems for electronic components
- Networked PC workstations for the maintenance process
- Component and repair database

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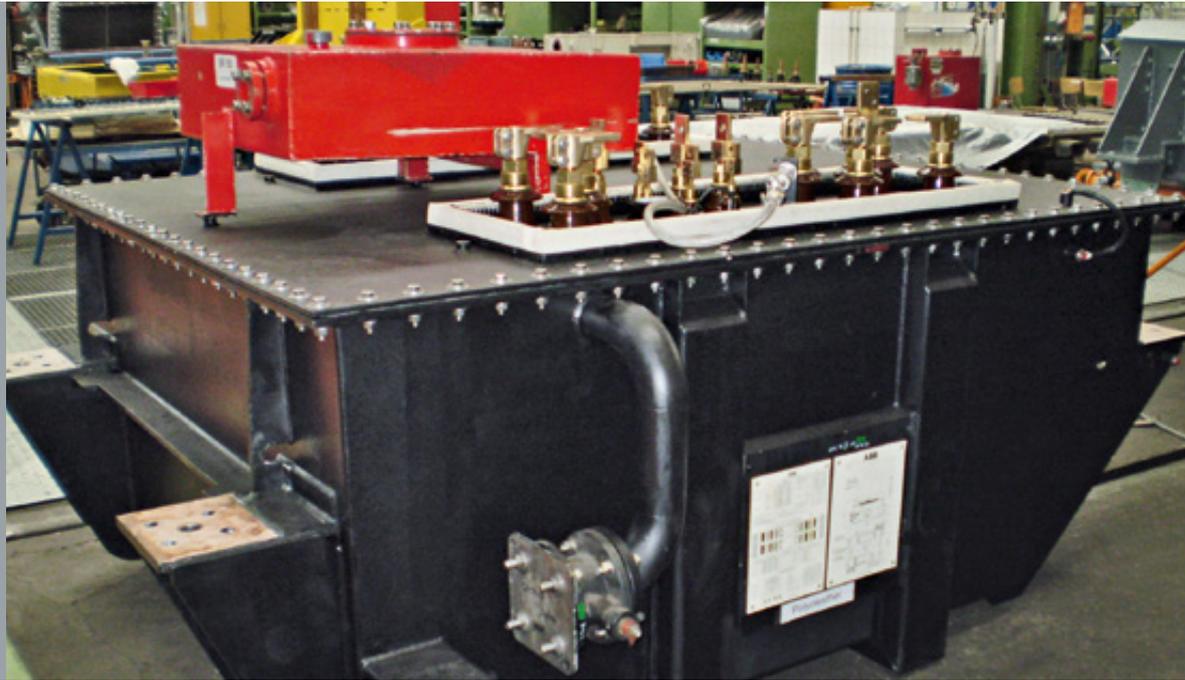
### References

Every year, we recondition some 14,500 control electronics components for electric drives.

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## 6. Transformers/inductors

**We are specialists in maintaining and reconditioning transformers and fabricating new inductors.**

Our broad service portfolio covers many different transformers, including those from the 101, 112, 143, 189, 401, 403, 411 and 423 model series.

All transformers are maintained in a four-stage process:

- Stage A: Remove active component and retighten/rewind, clean the connections, clean the tank and touch up paint, clean and recondition add-on parts and insulators or replace if necessary
- Stage B: Stage A services plus tank repair based on findings and a crack-detection test with paint applied over an extensive area
- Stage C: Stage B services plus recondition the yoke, interleave the iron core, recondition/repair the upper and lower structure, replace the coils if needed, repair the switching framework or replace if necessary
- Stage D: Stage C services plus replace the coils (wind in in-house production environment if required)

We leverage our many years of experience and extensive product range to recondition transformers so that we can quickly respond to your requirements and address problems. The high volume of reconditioned and fabricated components as well as streamlined maintenance depot servicing times also keep your costs to a minimum.



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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau uses the following equipment to maintain transformers:

- Transformer testing area
- Winding benches
- Drying ovens (including vacuum pressure)
- Oil lab
- Tilting mechanisms for properly turning, or rotating, the active transformer components
- Gasket production unit
- Transformer workshop

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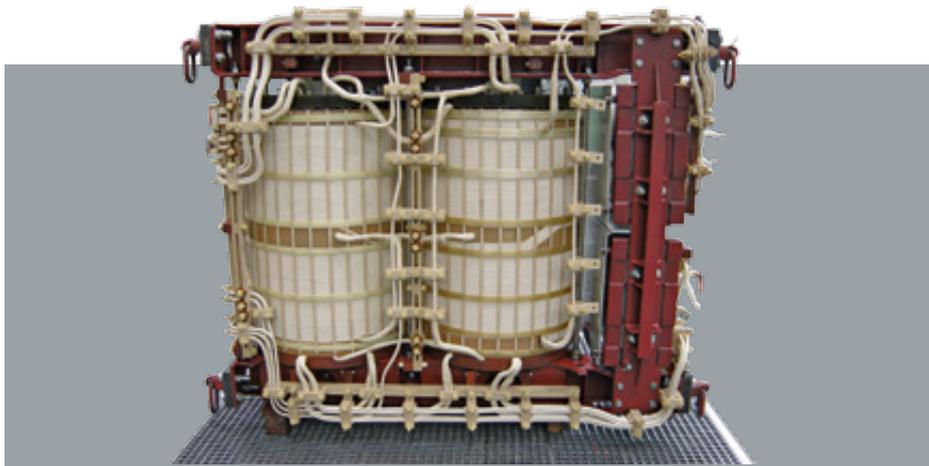
### References

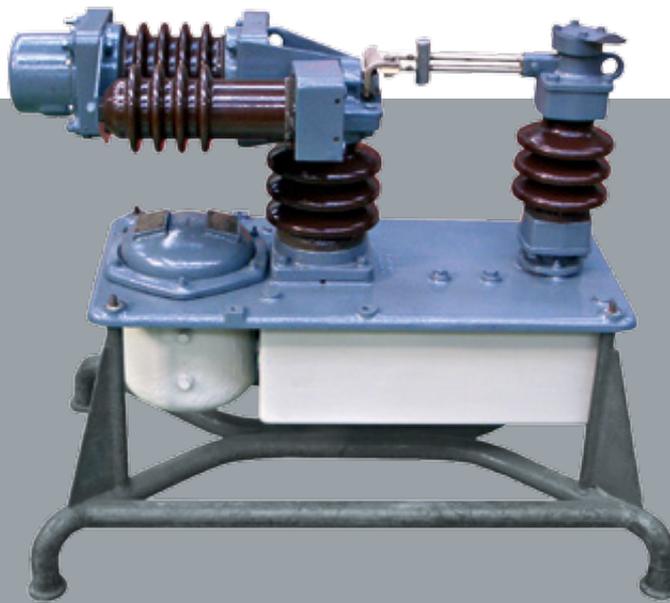
Every year, we recondition some 50 transformers from reputable manufacturers such as Siemens and ABB as well as fabricate approximately 150 inductors of differing types and configurations.

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## 7. Main circuit breakers

**We subject main circuit breakers to an extensive test and repair programme in our competence centre, then adjust them accordingly.**

Our portfolio encompasses main circuit breakers for a wide range of power system configurations, including 15 kV/16.7 Hz AC, 25 kV/50 Hz AC, 1.5 kV DC and 3.0 kV DC:

- Compressed-air high-speed circuit breakers (first generation of main circuit breakers)
- Vacuum circuit breakers (second generation of main circuit breakers)
- DC high-speed circuit breakers (for use in networks with a live power supply of 1.5 kV DC or 3.0 kV DC)

We carry out maintenance and repair work for different types of main circuit breakers as offered by the manufacturers BBC, KLEW, Siemens AG, Bombardier, Secheron, Richard AG, Microelettrica, Alstom and Skoda. In addition to replacing entire assemblies and individual components, we can also recondition components based on our findings.

You profit from our broad service portfolio and the know-how of our qualified and experienced personnel, who are specialised in repairing and testing many different types of main circuit breakers.

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### **Infrastructure**

The DB Fahrzeuginstandhaltung maintenance depot in Dessau is equipped with the necessary production areas, tools and testing facilities to repair the various main circuit breaker types.

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### **References**

Every year, up to 400 main circuit breakers of various designs are repaired and subjected to a final inspection.

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# III. Chassis

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## 1. Bogies

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## 2. Wheelsets

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## 3. Shock absorbers

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## 4. Trapezoidal springs

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## 5. Suspension bracket

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## 6. Braking systems

Brake components

Brake testing equipment

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## 7. Air-supply systems

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## 8. Buffing and drawing

Buffing and draw gear components

Couplings

Shunting couplers





## 1. Bogies

**We offer a comprehensive range of bogie overhauling services and repair work to correct many different types of accident damage.**

First, we individually inspect and assess all components and materials used in accordance with customer requirements, as this allows the components to be reconditioned and repaired according to their state upon dismantling. The steps we follow in reconditioning bogies for locomotives, electric multiple units, diesel multiple units, passenger coaches and freight cars include the following, depending on the design configuration:

- Dismantle and clean
- Inspect pneumatic, electric and mechanical assemblies for signs of wear
- Align
- Perform non-destructive testing such as magnetic particle inspection
- Repair damaged components based on the damage ascertained
- Inspect the brakes
- Check for distortion or warping of the bogie frame
- Straightening work (if required)
- Conduct a crack-detection test at the weld seams and restore or refurbish if necessary
- Apply paint
- Reassemble the bogie, including the wheelsets
- Adjust the bogie on the bogie press and carry out an alignment check
- Perform a functional test and draft a test report

All bogie reconditioning and repair services – from consulting and accident assessment through to completion of all necessary work – are provided from a single source. Our modern facilities, which represent the state of the art and ensure a high level of flexibility, also allow us to meet the demanding technical requirements associated with reconditioning bogies.

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### Infrastructure

The technical equipment used in the DB Fahrzeuginstandhaltung maintenance depots to maintain bogie systems includes:

- Cleaning equipment for bogies
- Bogie gauge stands
- Computer-assisted optical 3-D laser metrology
- Combined rotating and tilting apparatus for optimising the welding position
- Elevator tracks for assembling bogies
- Spring tester
- Workstations for conducting non-destructive material tests
- Axle-lowering system, among others



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### Contact

#### Electric locomotives:

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#### Diesel locomotives:

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#### Electric multiple units:

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Germany

#### Diesel multiple units:

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34128 Kassel  
Germany

#### Passenger coaches:

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Germany

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## 2. Wheelsets

**We are specialists in reconditioning and overhauling traction and carrying wheelsets on all rail-bound vehicles and providing the associated on-demand maintenance services.**

Our portfolio includes:

- Incoming inspection
- Cleaning
- Testing and measuring
- Ultrasonic, eddy current and magnetic particle testing of wheels, wheel and brake discs, shafts and brake parts
- Execution of disc, shaft, and final pressing work for train wheels, wheel and brake discs and wheelset shafts
- Profile turning of newly treaded and used wheelsets, rims and brake discs
- Inspection and repair of drives and wheelsets (including transmissions)
- Metal spraying and welding of wheels, bore holes, shafts and bearing seats
- Axle bearing analyses

You profit from our many years of experience in reconditioning wheelsets. State-of-the-art systems operated by a qualified team are ready and available to cater to specific customer needs and requirements.

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### Infrastructure

The technical equipment used in the DB Fahrzeuginstandhaltung depots to maintain wheelsets includes:

- Cleaning facilities for wheelsets
- Wheel measurement and test stands
- Tyre-removal stand
- Wheelset presses
- Automatic ultrasonic testing system for wheelset shaft longitudinal bore
- Inductive heating facility for tyres
- Workstations for conducting non-destructive material tests
- Computer-controlled wheelset clearance outline processing machine
- Wheelset run-in stand

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### References

Every year, some 65,000 wheelsets are reconditioned by DB Fahrzeuginstandhaltung.



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### Contact

#### Electric locomotives:

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Peterholzstrasse 15  
06849 Dessau-Rosslau  
Germany

#### Diesel locomotives:

DB Fahrzeuginstandhaltung GmbH  
Werk Cottbus  
Waisenstrasse 21  
03046 Cottbus  
Germany

#### Electric multiple units:

DB Fahrzeuginstandhaltung GmbH  
Werk Krefeld  
Breitenbachstrasse 69  
47809 Krefeld  
Germany

#### Diesel multiple units:

DB Fahrzeuginstandhaltung GmbH  
Werk Kassel  
Frasenweg 20-36  
34128 Kassel  
Germany

#### Passenger coaches:

DB Fahrzeuginstandhaltung GmbH  
Werk Neumünster  
Kieler Strasse 119  
24536 Neumünster  
Germany

#### DB Fahrzeuginstandhaltung GmbH

Werk Wittenberge  
Breeser Strasse 1  
19322 Wittenberge  
Germany

#### Freight wagons:

DB Fahrzeuginstandhaltung GmbH  
Werk Paderborn  
Hermann-Kirchhoff-Strasse 4  
33102 Paderborn  
Germany

E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)



### 3. Shock absorbers

**Well versed in inspecting and reconditioning shock absorbers, we can handle all types of shock absorber assemblies used on rolling stock.**

Our portfolio encompasses shock absorbers from the manufacturers Mannesmann-Sachs (Boge), Knorr-Bremse, Koni and Gerep/Sudburg, among others. We can also recondition the shock absorbers fitted to heritage vehicles.

Our shock absorber reconditioning services in detail:

- Dismantling the shock absorber
- Inspecting component parts
- Reassembling the shock absorber
- Computer-controlled check and recording of measured data
- Painting and labelling of the shock absorber

We only use OEM parts when reconditioning shock absorber assemblies. Special inspections, series testing, and other services can also be rendered upon request.

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#### **Infrastructure**

The DB Fahrzeuginstandhaltung maintenance depot in Krefeld is equipped with fully electronic testing facilities. This enables personnel to not only plot the “force/displacement diagrams” specified by the respective manufacturers, but also simulate different positions of the dampers in the vehicle.

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#### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Krefeld  
Breitenbachstrasse 69  
47809 Krefeld  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 4. Trapezoidal springs

**We recondition and inspect all trapezoidal springs for rolling stock, including those found in freight cars, passenger coaches, traction units, locomotives and special-purpose vehicles.**

Specifically, the springs are reconditioned and inspected in accordance with VPI module 05 and the associated technical values (drawings, technical documentation).

Our service portfolio includes:

- Inspections (based on operating hours)
- Repairs (encompassing the following scope):
  - Full dismantling and reassembly of the trapezoidal springs
  - Examination of the component parts
  - Reconditioning or exchange of the component parts
  - Surface preservation with Elaskon anti-corrosion coating

You profit from our know-how and proficiency in reconditioning and inspecting trapezoidal springs.

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### **Infrastructure**

The production competence centre for transmissions and springs at the DB Fahrzeuginstandhaltung maintenance depot in Dessau is responsible for reconditioning trapezoidal springs, where the necessary improvements are made to each component along a state-of-the-art production line.

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Produktions-Kompetenz-Center Getriebe/Federn  
Emilienstrasse 45  
09131 Chemnitz  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 5. Suspension bracket

**We are your specialist remanufacturer of suspension brackets for two-axle freight wagons.**

Our service profile includes the remanufacture of running gear components for two-axle freight wagons with UIC approval using semi-mechanical welding methods.

We are the only manufacturer of these UIC components and have been certified accordingly by DB Systemtechnik GmbH.

---

### **Infrastructure**

To carry out this work, a welding facility with a contour welding machine capable of circular welding and trimming as well as a roller conveyor are available at the Chemnitz maintenance depot.



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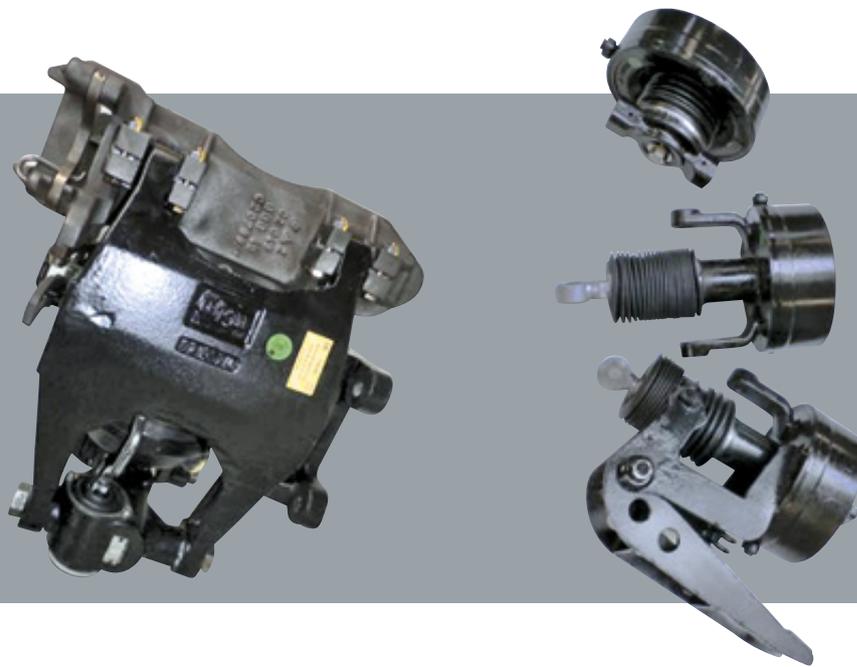
#### **Certification**

- Test of welded structures (STBP), Part 2, suspension bracket for freight wagons dated 12 May 2016
- Certificate – Welding of Railway Vehicles and Components in accordance with DIN EN 15085-2/certification level: CL 1 in accordance with DIN EN 15085-2 dated 19 May 2016

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#### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Produktions-Kompetenz-Center Getriebe/Federn  
Emilienstrasse 45  
09131 Chemnitz  
Germany  
E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)



## 6. Braking systems *Brake components*

We are a specialist in reconditioning, modernising, inspecting and converting brake components of all manufacturers.

Our service portfolio includes the following work, which is carried out on the components listed below:

### **Control and relay valves:**

- Dismantle and clean
- Reconditioning and exchange replacement parts
- Perform a final inspection at our test centres

### **Driver's brake valves:**

- Dismantle and clean
- Repair and exchange specified replacement parts
- Perform a final functional test at our test stands

### **Brake containers, brake modules and brake equipment panels:**

- Recondition components
- Inspect and compile findings report (as requested)
- Coordinate shipment and collection (maintenance depot)

### **Slack adjusters:**

- Recondition on a takt-based production line
- Modernise design
- Apply paint and accurately label components

### **Brake cylinders and brake calipers:**

- Recondition on a takt-based production line
- Assess condition and compile findings report (as requested)
- Inspect in automatic test centres

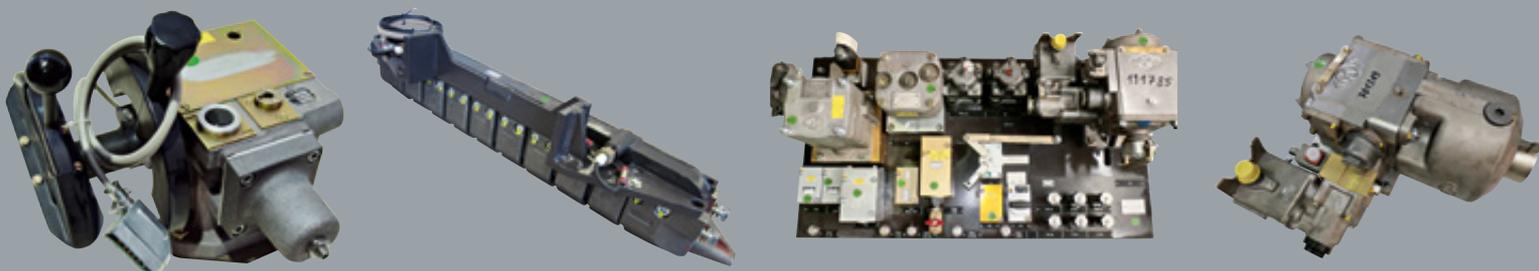
### **Magnetic track brake:**

- Recondition in accordance with defined requirements
- Repair and examine the housings and actuating cylinders
- Carry out final assembly as per the specifications and dimensions provided by the customer

### **Small components (relief valves, air stop cocks, pressure reducing valves, hose connections, coupling hoses and windscreen wiper drives):**

- Recondition small rolling stock components
- Repair or replace components
- Recommend alternatives if reconditioning work does not prove cost effective

You benefit from our well-founded expertise and years of experience. We are also familiar with the processes and procedures applied to recondition components and inspect all pneumatic brake parts found on rolling stock in line with the conditions established by the UIC.



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### **Infrastructure**

Components are reconditioned in state-of-the-art production areas at the Fulda maintenance depot and at DB Fahrzeuginstandhaltung's production unit in Delitzsch. An end-to-end testing and inspection infrastructure safeguards the necessary functional requirements, while a central document management system ensures transparency throughout the processes used.

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### **References**

With an annual capacity of over 165,000 brake components, we are one of Europe's leading specialists in brake valve systems.

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### **Certification**

We have the approval required to recondition pneumatic and mechanical brake components and have been certified, audited and authorised for other key processes and systems, such as:

- ECM certified
- Quality management system certified under EN ISO 9001:2008
- Environmental management system certified under EN ISO 14001:2004
- Qualification of systems used for maintenance (QSI certificate)
- Authorised test workshop (NDT)

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Fulda  
An der Richthalle 1  
36037 Fulda  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 6. Braking systems *Brake testing equipment*

We offer a comprehensive range of brake testing equipment services that cater to the requirements of many different applications.

To this end, our portfolio includes rebuilding and repair work as well as regular inspections and calibration of PDR brake testing equipment:

- PDR 1 for goods and passenger trains, also with remote control capability
- PDR 3/4/5 with or without auxiliary device
- PDR 6 as per customer configuration
- PDR 7 with automatic inspection sequence for executing and documenting brake tests on rolling stock as per brake testing requirements

We can also fit PDR brake testing equipment with additional accessory items at the customer's request. Training courses are likewise offered for all commercially available brake testing equipment.

You profit from our broad technical knowledge and many years of experience in reconditioning brake components. We are also familiar with the processes and procedures applied to recondition components and inspect all pneumatic brake parts found on rolling stock in line with the conditions established by the UIC.

---

### Infrastructure

PDR brake testing equipment is developed and manufactured at DB Fahrzeuginstandhaltung's maintenance depot in Fulda, where we maintain a separate production segment for this purpose.

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### References

Every year, some 50 brake testers are manufactured.

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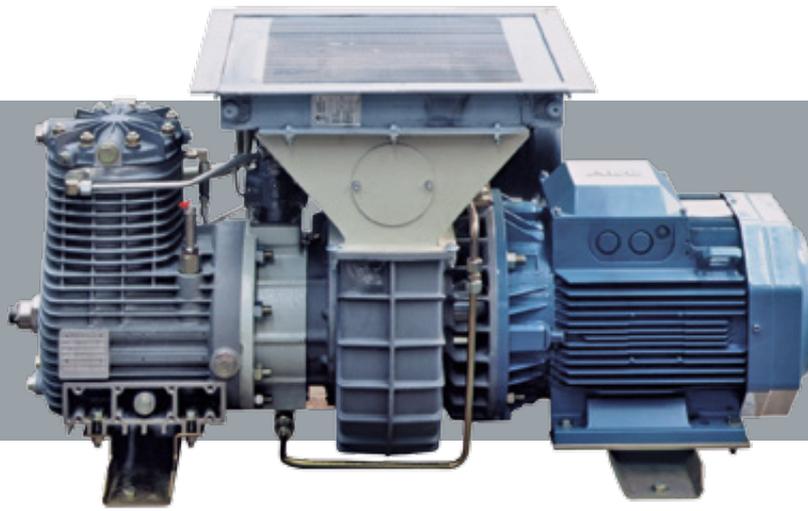
### Certification

EBA (German Federal Railway Authority) approval for maintaining pneumatic and other brake parts.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
Werk Fulda  
An der Richthalle 1  
36037 Fulda  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 7. Air-supply systems

We offer assignment-based examination and assessment services for air-supply systems and electrical auxiliary equipment.

Our service portfolio encompasses the following components:

- Piston compressors
- Screw compressors
- Oil-free compressors
- Single and double-chamber air drying systems
- Auxiliary compressors (lubricated with oil or oil-free)
- Traction motor blower
- Braking resistor fan
- Fans for oil-cooling systems
- Fans and motors from traction units of all different types and manufacturers

Comprehensive documentation (including reference to pressures, temperatures, oil quantity in compressed air, flow rate measurement, changeover or switch times, and electrical parameters) is provided as part of reconditioning. Component-specific investigations can also be conducted and reports created.

Our optimally coordinated production process helps you minimise costs. We can check and test all electrically operated auxiliary equipment and air-supply systems for traction units. The testing scope can be aligned here with specific customer requirements, depending on the parameters involved.

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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Dessau repairs electrical auxiliary equipment and air-supply systems and their components using state-of-the-art production machines, balancing systems and test facilities.

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### References

Every year, around 5,000 components of differing designs and configurations are reconditioned.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Peterholzstrasse 15  
06849 Dessau-Rosslau  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 8. Buffing and drawing *Buffing and draw gear*

We repair many different types of buffing and draw gear.

Our portfolio includes:

- Buffer repair on a takt-based production line
- Repair of various types of draw gear
- Non-destructive material tests

We also carry out customised repair work.

You profit from our solid know-how in repairing buffer systems.

We offer reconditioning services at favourable rates and with volume-based turnover, if required. Our sophisticated logistics system also allows us to meet supply needs when even higher requirements are involved.

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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Paderborn is well equipped to repair buffing and draw gear:

- Vertical drilling machine
- Milling cutters for opening buffers
- Dismantling press
- Mechanical transport system (roller conveyor)
- Continuous washing machine for buffer assemblies
- Centrifuge blasting system for inner rings
- Efficient assembly devices for friction springs and buffers
- Lifting machinery
- Ground conveyors
- Inspection systems for buffers and friction springs
- Magnetic particle testing system for buffer plungers and buffer guides
- Welding jig for welding buffers

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### References

On behalf of Deutsche Bahn, we repair buffing and draw gear for DB Fernverkehr, DB Regio, DB Cargo and other railway undertakings.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
Werk Paderborn  
Hermann-Kirchhoff-Strasse 4  
33102 Paderborn  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 8. Buffing and drawing *Couplings*

**We perform not only general overhauls on couplings, but also on-demand maintenance such as accident repair and modernisation work.**

Our service portfolio caters to couplings from different manufacturers for diesel multiple units, electrical multiple units and high-speed trains (ICE) and covers assemblies such as:

- Automatic couplings
- Close couplings
- Transition and emergency couplings

We are a reliable and experienced partner when it comes to repairing couplings and performing general overhauls. It also goes without saying that all work is carried out to your specific requirements. For example, we can limit our activities to repairing the coupling head or the buffing and draw gear of an automatic coupling assembly.

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### **Infrastructure**

The coupling workshop plays an integral role in component manufacturing at the DB Fahrzeuginstandhaltung maintenance depot in Kassel. Press tooling and coupling clearance gauges, among other equipment, are used to recondition and repair couplings.

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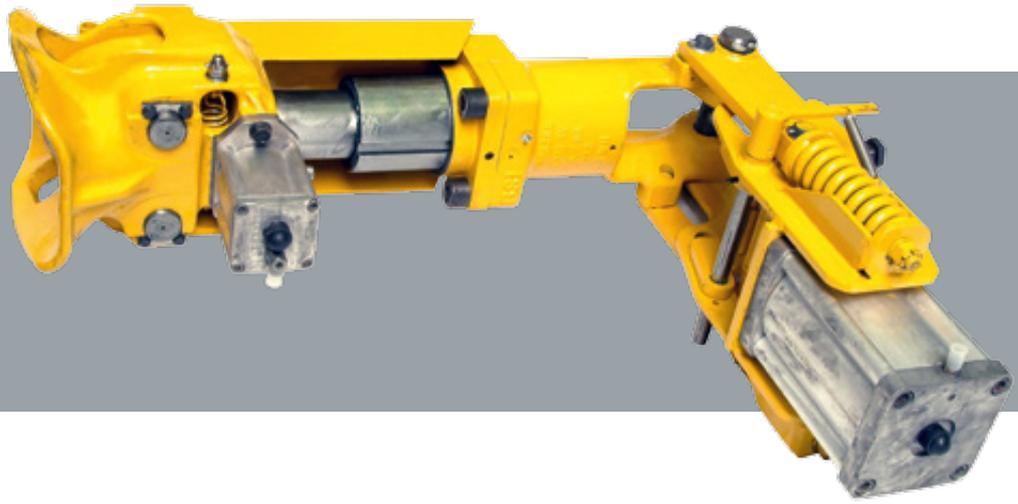
### **References**

We recondition some 1,400 couplings per year for Deutsche Bahn and other national and international railway undertakings.

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Kassel  
Frasenweg 20-36  
34128 Kassel  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 8. Buffing and drawing *Shunting couplers*

We offer repair services for the RK 900 shunting coupler, a safety-relevant component of the buffing and draw gear assembly for diesel/gas railcars with radio remote control.

Shunting couplers are checked and inspected at regular intervals and refurbished to OEM condition if required.

Our portfolio includes:

- Full dismantling and cleaning
- Inspection of assemblies
- Reconditioning or replacement of assemblies
- Painting the shunting coupler
- Testing the shunting coupler for proper functioning

We maintain RK 900 shunting couplers in accordance with valid technical specifications (repair manual provided by the manufacturer and relevant drawings).

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### **Infrastructure**

All shunting couplers are reconditioned in a state-of-the-art workshop in the production competence centre for transmissions and springs at the DB Fahrzeug-instandhaltung maintenance depot in Dessau.

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Produktions-Kompetenz-Center Getriebe/Federn  
Emilienstrasse 45  
09131 Chemnitz  
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E-mail: sales-fzi@deutschebahn.com

# IV. On-board systems

1. Air conditioning systems

2. Driving cab A/C equipment

3. Doors

4. Electronics

Radio and control safety equipment

Control electronics

Passenger information systems

Mechatronics

On-board electronics

Terminals

Controls





## 1. Air conditioning systems

**We offer maintenance and repair services for air conditioning systems and climate control components found on rolling stock.**

Our service portfolio includes repair services for:

- Condenser units
- Air-treatment appliances
- Driving cab A/C equipment

The results of the reconditioning work and actual performance values are logged and made available to the customer.

You profit from our know-how and wide range of services. We not only maintain and repair the air conditioning systems of passenger coaches and diesel multiple units, but can also offer these services for other rolling stock.

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### **Infrastructure**

All maintenance and repair work on air conditioning systems and A/C components is carried out exclusively at the DB Fahrzeuginstandhaltung maintenance depots in Neumünster and Kassel, which maintain a separate production segment for this purpose.

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### **Certification**

Every employee who works on an air conditioning system has been awarded a personal certificate that qualifies him or her to conduct maintenance and repair work on such systems.

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Wittenberge  
Breeser Strasse 1  
19322 Wittenberge  
Germany

DB Fahrzeuginstandhaltung GmbH  
Werk Kassel  
Frasenweg 20-36  
34128 Kassel  
Germany

DB Fahrzeuginstandhaltung GmbH  
Werk Neumünster  
Kieler Strasse 119  
24536 Neumünster  
Germany

E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)



## 2. Driving cab A/C equipment

We maintain driving cab A/C equipment from reputable manufacturers such as Mahle Behr and Liebherr for locomotives, multiple units and driving trailers.

We maintain driving cab A/C equipment based on our findings and detailed customer specifications:

- Clean and inspect
- Perform work based on findings (e.g. replace fan, make minor repairs)

The inspection always includes a functional test comprising the following steps: Inspect the refrigeration circuit for any leaks, verify the operative function of safety devices, extract the refrigerant and evacuate the refrigeration circuit, purge and refill the refrigerant. This is then followed by a final inspection. The high volume of reconditioned components that result from replacing the bearings of fans and repairing controls, for example, helps us reduce costs and minimise in-shop repair times.

### Infrastructure

Our array of technical equipment used to repair driving cab A/C equipment at the DB Fahrzeuginstandhaltung maintenance depot in Dessau encompasses:

- Machines for carrying out soldering work on A/C systems found on rolling stock
- A/C-compliant workshop systems and equipment
- A/C servicing units

### Certification

Our highly qualified personnel are certified to perform work that involves directly accessing the refrigeration circuit.

### Contact

#### Electric locomotives

DB Fahrzeuginstandhaltung GmbH  
Werk Dessau  
Peterholzstrasse 15  
06849 Dessau-Rosslau  
Germany

#### Diesel locomotives

DB Fahrzeuginstandhaltung GmbH  
Werk Kassel  
Frasenweg 20–36  
34128 Kassel  
Germany

#### Electric multiple units

DB Fahrzeuginstandhaltung GmbH  
Werk Krefeld  
Breitenbachstrasse 69  
47809 Krefeld  
Germany

#### Passenger coaches

DB Fahrzeuginstandhaltung GmbH  
Werk Wittenberge  
Breeser Strasse 1  
19322 Wittenberge  
Germany

#### Passenger coaches

DB Fahrzeuginstandhaltung GmbH  
Werk Neumünster  
Kieler Strasse 119  
24536 Neumünster  
Germany

E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)



### 3. Doors

**We are specialists in performing maintenance, general overhauling and repair work as well as applying colour coats to doors for a wide range of applications.**

Our services cover the following doors, including those offered by the manufacturers Bode, Ife, Kiekert and Faiveley:

- Hinged folding doors
- Hinged sliding doors
- End wall doors
- Intercar doors
- Access doors (swing doors)

We can also convert doors and equip them with monitoring systems and other auxiliary devices, for example. Other services include adapting entryways to platform heights and bridging the gap between the body of the car and the edge of the platform. Automatic passenger counting systems can also be installed in your vehicles.

You profit from our broad range of door maintenance services. Less extensive work is carried out directly on the vehicle, without the need to remove and refit the doors. For more elaborate projects, we can choose to repair the doors in our production competence centre.

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#### **Infrastructure**

Our maintenance depots have a separate production unit, or production segment, for maintaining door assemblies.



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### **Certification**

All of our employees in the door workshop have attended the training courses required for the services we offer and carry out work in line with the 3422 qualification standard for maintenance technicians who service vehicle doors.

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### **Contact**

DB Fahrzeuginstandhaltung GmbH  
Werk Wittenberge  
Breeser Strasse 1  
19322 Wittenberge  
Germany

DB Fahrzeuginstandhaltung GmbH  
Werk Neumünster  
Kieler Strasse 119  
24536 Neumünster  
Germany

DB Fahrzeuginstandhaltung GmbH  
Werk Kassel  
Frasenweg 20-36  
34128 Kassel  
Germany

E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)



## 4. Electronics *Radio and safety control equipment*

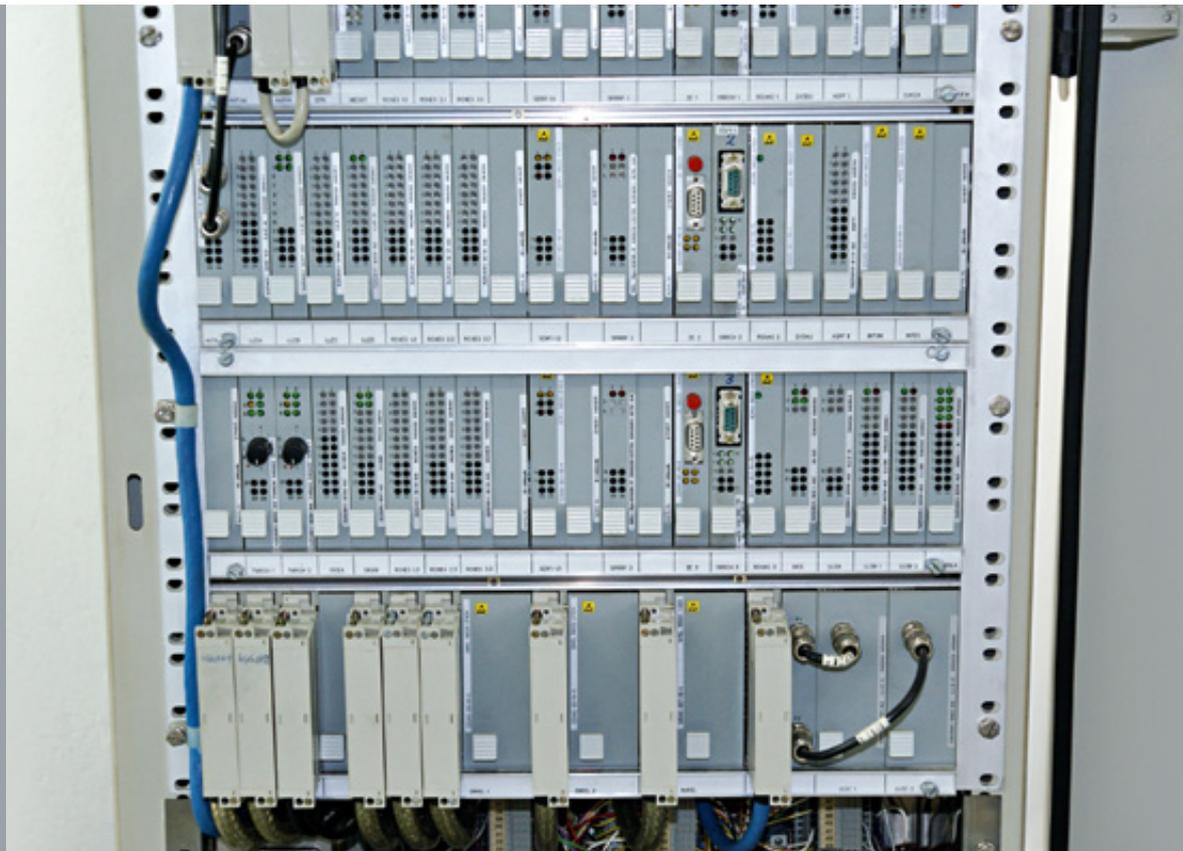
**We are the specialists for maintaining and repairing all components of GSM-R systems (Hörmann and Center System) and the LZB80/16 system (Siemens/Thales).**

These components are installed in all trains operated in the German and European railway networks.

We offer the following services:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Installing software
- Pre-emptive replacement of ageing components
- Obsolescence management for components
- Repairs
- Acceptance testing
- Documentation
- Documentation of repair statistics
- On-site services (provided on a case-by-case basis)

You profit from our skills and know-how as the only authorised repair workshop for LZB (continuous automatic train-running control) 80/16 in Europe.



---

### Infrastructure

The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers the following equipment and services for maintaining components:

- Product-specific inspection towers for simulating the train system of complete components
- Separate test programs for plug-in circuit boards (including in-circuit tests)
- Procurement and storage of replacement parts

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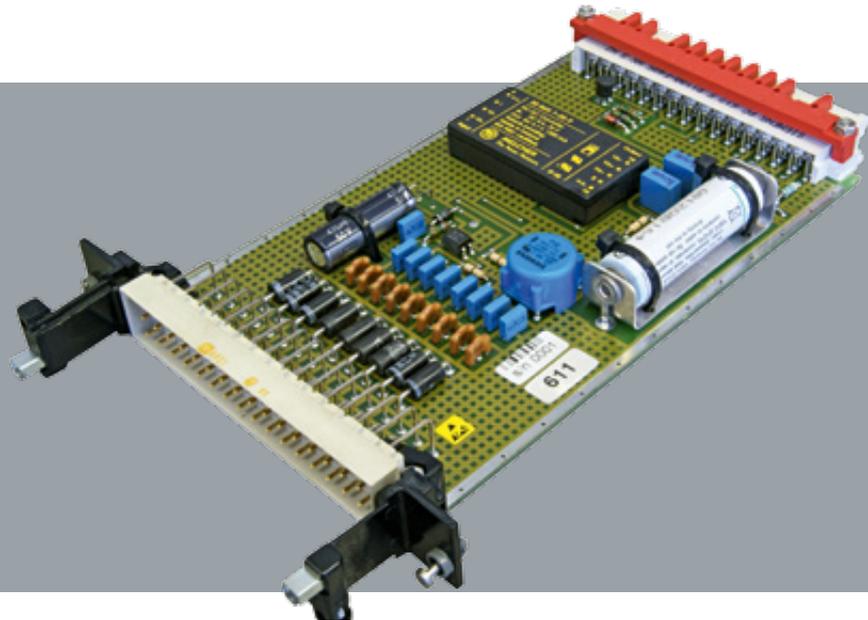
### Certification

Repair outlet authorised by the manufacturers Hörmann, Center System, Deuta and Siemens/Thales.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
EZW München  
Germany  
Bertha-Kipfmüller Strasse 48  
81249 München  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 4. Electronics *Control electronics*

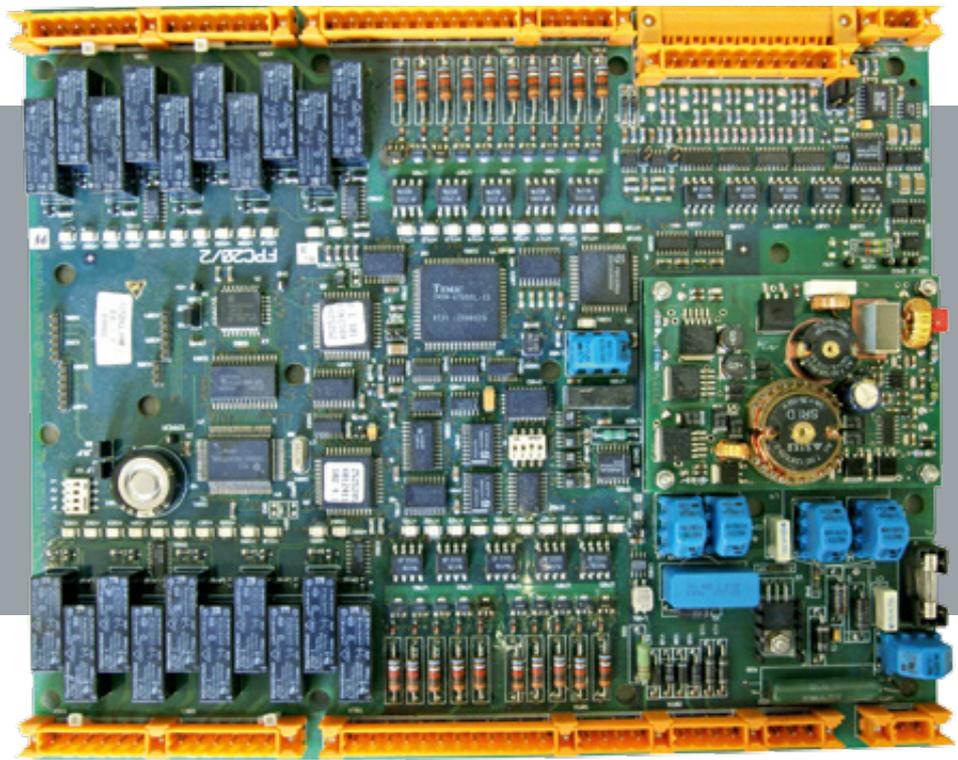
We specialise in repairing many control electronics products found in rolling stock, including models from manufacturers such as GEZ, IFE, FAGA, AEG, Luwa, ABB, Schaltbau, Faiveley, Siemens, Krupp, Knorr Bremse and Bombardier.

Electronic components for the following assemblies are included in our service portfolio:

- Door controls
- Lavatory controls
- Minimum voltage relays
- Compact controllers
- A/C controls
- Wheel slide protection system
- Traction controllers
- CCTV surveillance
- Diagnostic systems
- DC/DC converters
- Emergency braking bypass units

We offer the following services for maintaining control electronics components:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Stripping and applying paint
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Obsolescence management for components
- Installing software
- Pre-emptive replacement of ageing components
- Repairs
- Acceptance testing



- Documentation
- Documentation of repair statistics
- Hotline support
- On-site services (provided on a case-by-case basis)

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components.

---

### Infrastructure

The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers the following equipment and services for maintaining components:

- Product-specific testing equipment
- In-circuit testers (Hewlett-Packard, Marconi, Reinhardt, Seica, Pinpoint)
- Internally developed modular functional test systems

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### Contact

DB Fahrzeuginstandhaltung GmbH  
EZW München  
Germany  
Bertha-Kipfmüller Strasse 48  
81249 München  
Germany  
E-mail: sales-fzi@deutschebahn.com



## 4. Electronics *Passenger information systems*

**We are specialists in repairing many information systems for rolling stock, including models from manufacturers such as VST/Vossloh, Adtranz, Brose, Annax, Focon and GSP.**

The following electronic components are just some of the products we service in our portfolio:

- Destination displays
- Side displays
- Interior displays
- Barcode identifiers
- Various diagnostic equipment
- Control modules
- Radio/wireless modules
- Call stations

We offer the following services for maintaining passenger information systems:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Obsolescence management for components
- Installing software
- Pre-emptive replacement of ageing components
- Repairs
- Acceptance testing
- Long-term tests (as needed)
- Documentation
- Documentation of repair statistics
- Hotline support
- On-site services (provided on a case-by-case basis)

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components.



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### Infrastructure

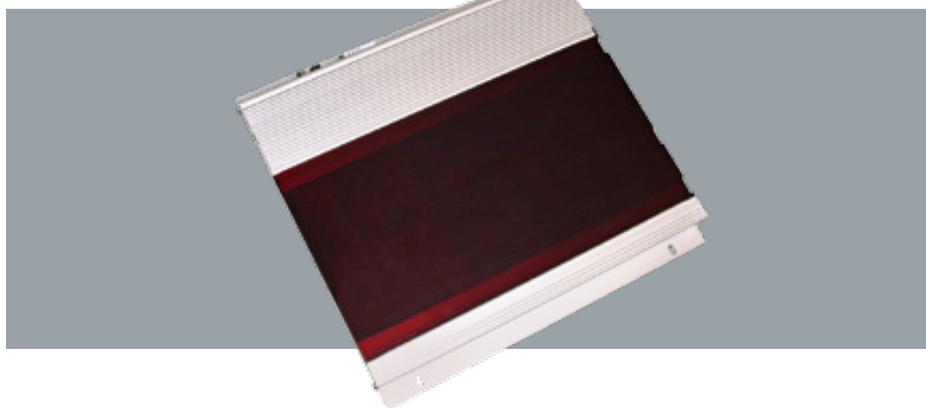
The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers the following equipment and services for maintaining components:

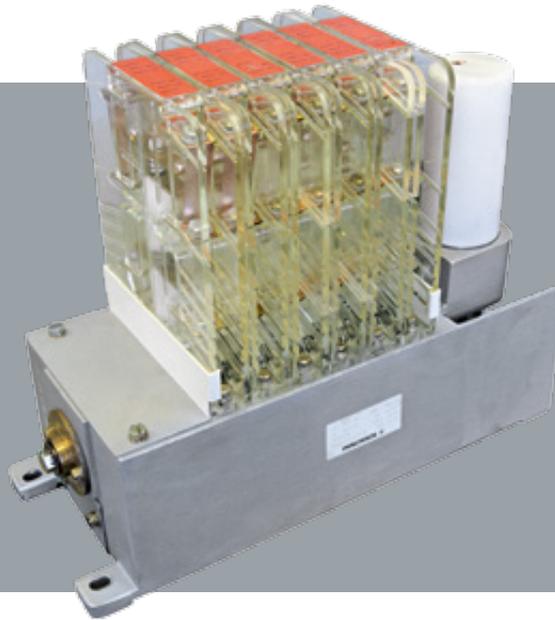
- Product-specific testing equipment
- Simulation of on-board train systems for functional testing

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### Contact

DB Fahrzeuginstandhaltung GmbH  
EZW München  
Bertha-Kipfmüller Strasse 48  
81249 München  
Germany  
E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)





## 4. Electronics *Mechatronics*

We specialise in repairing many of the electromechanical components found in rolling stock, including models from manufacturers such as Schaltbau, Luwa and AEG.

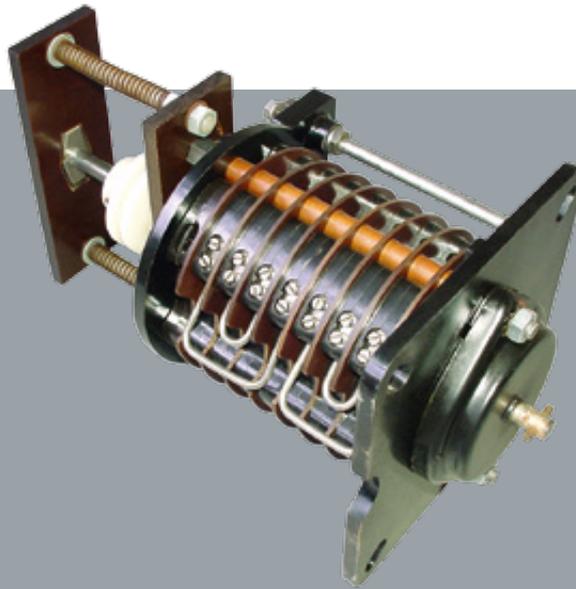
The following electronic components are just some of the products we service in our portfolio:

- Main circuit breaker inserts
- Control current contactors
- Power contactors
- Voltage selectors
- Rpm gauges
- Various relays
- Power output elements
- Overvoltage controllers

The following services are available for maintaining electromechanical components:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Obsolescence management for components
- Pre-emptive replacement of ageing components
- Repairs
- Acceptance testing
- Documentation
- Documentation of repair statistics
- Hotline support
- On-site services (provided on a case-by-case basis)

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components.



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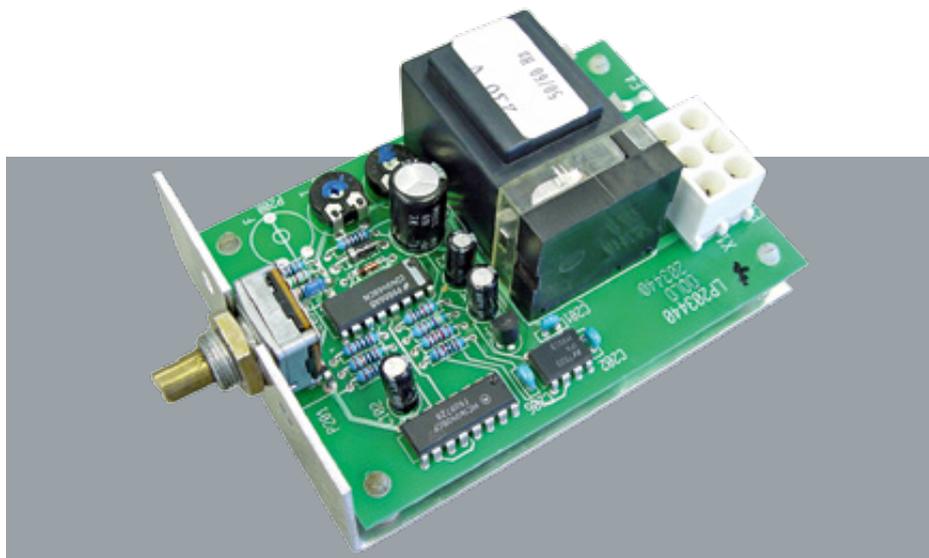
### Infrastructure

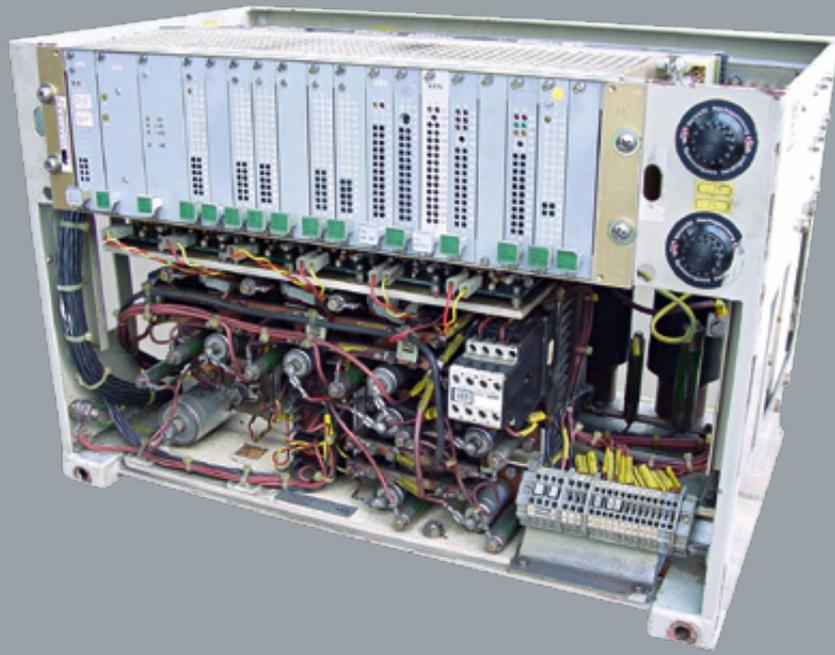
The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers a range of product-specific testing equipment to verify the operative function of components.

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### Contact

DB Fahrzeuginstandhaltung GmbH  
EZW München  
Bertha-Kipfmüller Strasse 48  
81249 München  
Germany  
E-mail: [sales-fzi@deutschebahn.com](mailto:sales-fzi@deutschebahn.com)





## 4. Electronics *On-board electronics*

**We are specialists in reconditioning power electronics.**

Our service repertoire covers a wide range of on-board power supply systems from manufacturers such as Krupp, ABB, Schaltbau, Faga, Bombardier, SMA, Siemens, AEG and Pintsch and includes the following equipment, among others:

- Three-phase converters (low temperatures, pressure protection, supply air, etc.)
- Inverters (heating, etc.)
- Chargers and converters for passenger coaches, electrical multiple units, diesel multiple units, high-speed trains and diesel locomotives

We offer the following services for maintaining power electronics:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Obsolescence management for components
- Repair of controlling electronic assemblies at component level
- Load tests, long-term tests
- Documentation
- Documentation of repair statistics
- Hotline support
- On-site services (provided on a case-by-case basis)

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components. We also have a unique infrastructure for maintaining and servicing power electronics.



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### Infrastructure

The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers the following equipment and services for maintaining components:

- Complex, versatile testing area with 25 test stands
- Simulation of different voltages, such as 1 kV at 16.7 Hz or 3 kV of direct voltage
- Total power in the 16.7 Hz range: approx. 400 kVA
- Mean voltage testing area with up to 5 kV of DC voltage and AC voltage (without power)
- Load benches for batteries and motors, for example

---

### Contact

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## 4. Electronics *Terminals*

We are specialists in reconditioning many information system products found in rolling stock, including models from manufacturers such as Schaltbau, Bachleitner and Heugel, Deuta, VST/Vossloh, Adtrans, Brose, Annax, GSP, Pintsch and EBEG, among others:

- Ebula (electronic working timetable and speed restrictions) on-board units
- Driver's cab and driver terminals
- Various diagnostic equipment

We offer the following services for maintaining power electronics:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Identifying and acquiring material(s)
- Obsolescence management for components
- Installing software
- Pre-emptive replacement of ageing components
- Repairs down to component level
- Acceptance testing (involving climate exposure test cabinet and cyclic loading conditions)
- Documentation
- Documentation of repair statistics
- Hotline support
- On-site services (provided on a case-by-case basis)

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components.



---

### Infrastructure

The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers the following equipment and services for maintaining components:

- Product-specific inspection towers for simulating the train system of complete components
- Separate test programs for plug-in circuit boards (including in-circuit tests)
- Procurement and storage of replacement parts

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### Contact

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## 4. Electronics *Controls*

We specialise in repairing many rail vehicle controls and control panels offered by different manufacturers.

We offer the following services:

- Functional testing (NNF, fault isolation)
- Visual inspections
- Dismantling and cleaning
- Troubleshooting with specific testing equipment
- Obsolescence management for components
- Pre-emptive replacement of ageing components
- Repairs
- Acceptance testing
- Documentation
- Documentation of repair statistics
- Hotline support

You profit from our extensive product experience, good access to replacement parts and associated documentation as well as obsolescence management for components.

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### **Infrastructure**

The central electronics workshop (EZW) operated by DB Fahrzeuginstandhaltung offers a range of product-specific testing equipment to verify the operative function of components.

---

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# V. Interior

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1. Kitchen appliances

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2. Upholstery

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3. Self-contained lavatory systems





## 1. Kitchen appliances

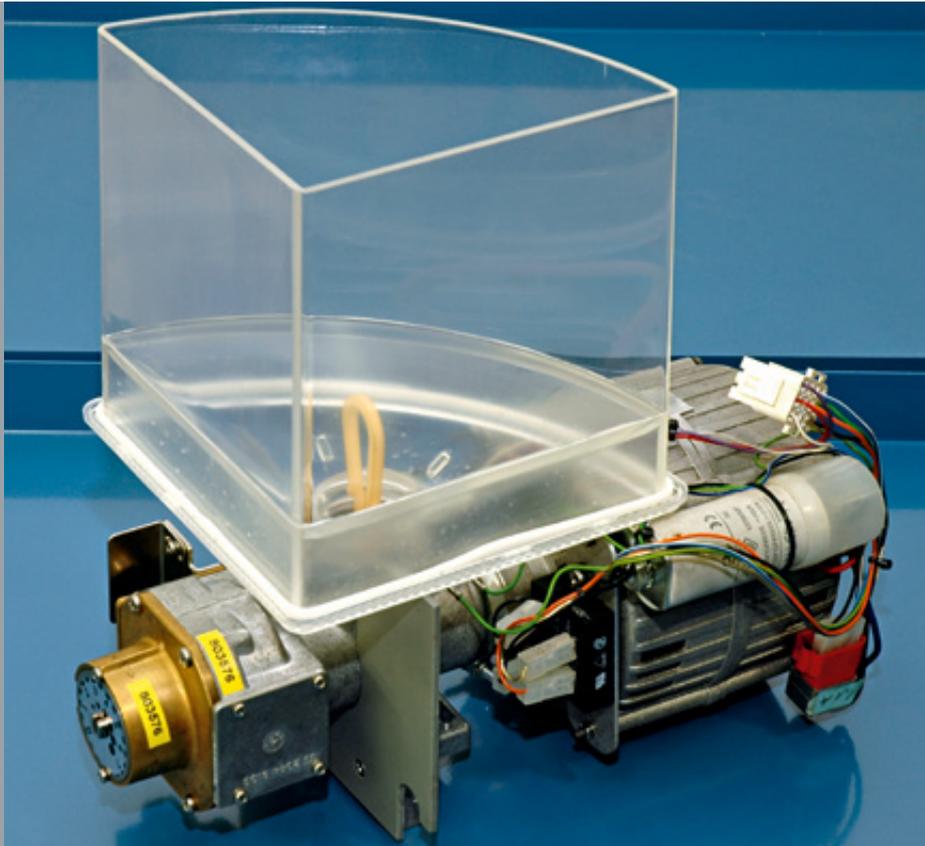
**We are the specialists in maintaining and repairing kitchen appliances for a wide range of applications.**

Ensuring that kitchen appliances function properly en route is critical to offering good service to passengers. Checking these appliances at regular intervals and providing corresponding documentation is therefore an excellent proactive measure.

Our service offering encompasses maintaining and repairing components in the following kitchen appliances as well as replacing them, as needed, from our acquired supply of replacement parts:

- Coffee makers
- Microwave ovens
- Dishwashers
- Steamer
- Kitchen componentry (including grinders, brewing units and pressure-booster pumps)

You profit from our broad range of services for maintaining and repairing kitchen appliances. We can also fit appliances with additional accessory equipment at the customer's request.



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**Infrastructure**

The DB Fahrzeuginstandhaltung maintenance depot in Neumünster has a separate production segment for kitchen appliances.

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**Certification**

We only employ personnel trained by Deutsche Bahn and the manufacturer.

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## 2. Upholstery

**We are specialists in reconditioning seat cushions and components.**

A wide range of reconditioning services is available for seats installed in rail vehicles and includes:

- Seat and backrest upholstery
- (Side) head rests, head restraints
- Seat arrangements/clusters, bistro seats
- Upholstery top layers (city railway)
- Couchettes (DB CityNightLine)
- Armrests
- Folding seats
- Child seats
- Finished covers
- Curtains, shades
- Driver and co-driver seats (control car, locomotives)

You profit from our broad range of services for reconditioning upholstery and its components. We also offer customised services and can even work on leather, if requested.



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### **Infrastructure**

The DB Fahrzeuginstandhaltung maintenance depot in Wittenberge has a separate production segment for upholstery work.

---

### **References**

We recondition some 100,000 upholstered items and their components per year.

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### **Certification**

We only employ personnel trained by Deutsche Bahn or the manufacturer for reconditioning upholstery.

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### **Contact**

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Breeser Strasse 1  
19322 Wittenberge  
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### 3. Self-contained lavatory systems

**We are the specialists in maintaining and repairing self-contained lavatories and carrying out documented functional tests for a wide range of applications.**

Our service portfolio includes repairing the following components of self-contained lavatories:

- Lavatory modules
- Valve control panels for self-contained lavatory systems
- Wastewater containers
- Utility water reservoirs

You profit from our broad range of services for maintaining and repairing self-contained lavatories. We can also fit lavatories with additional accessory equipment at the customer's request.

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#### **Infrastructure**

All maintenance and repair work on self-contained lavatories is carried out in the DB Fahrzeuginstandhaltung maintenance depots in Neumünster and Wittenberge. Both maintenance depots have a separate production segment for self-contained lavatories.

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#### **References**

Per year we service and repair some 3,000 lavatory modules and valve control panels as well as 70 wastewater containers.

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#### **Certification**

We only employ personnel trained by Deutsche Bahn and the manufacturer.

---

#### **Contact**

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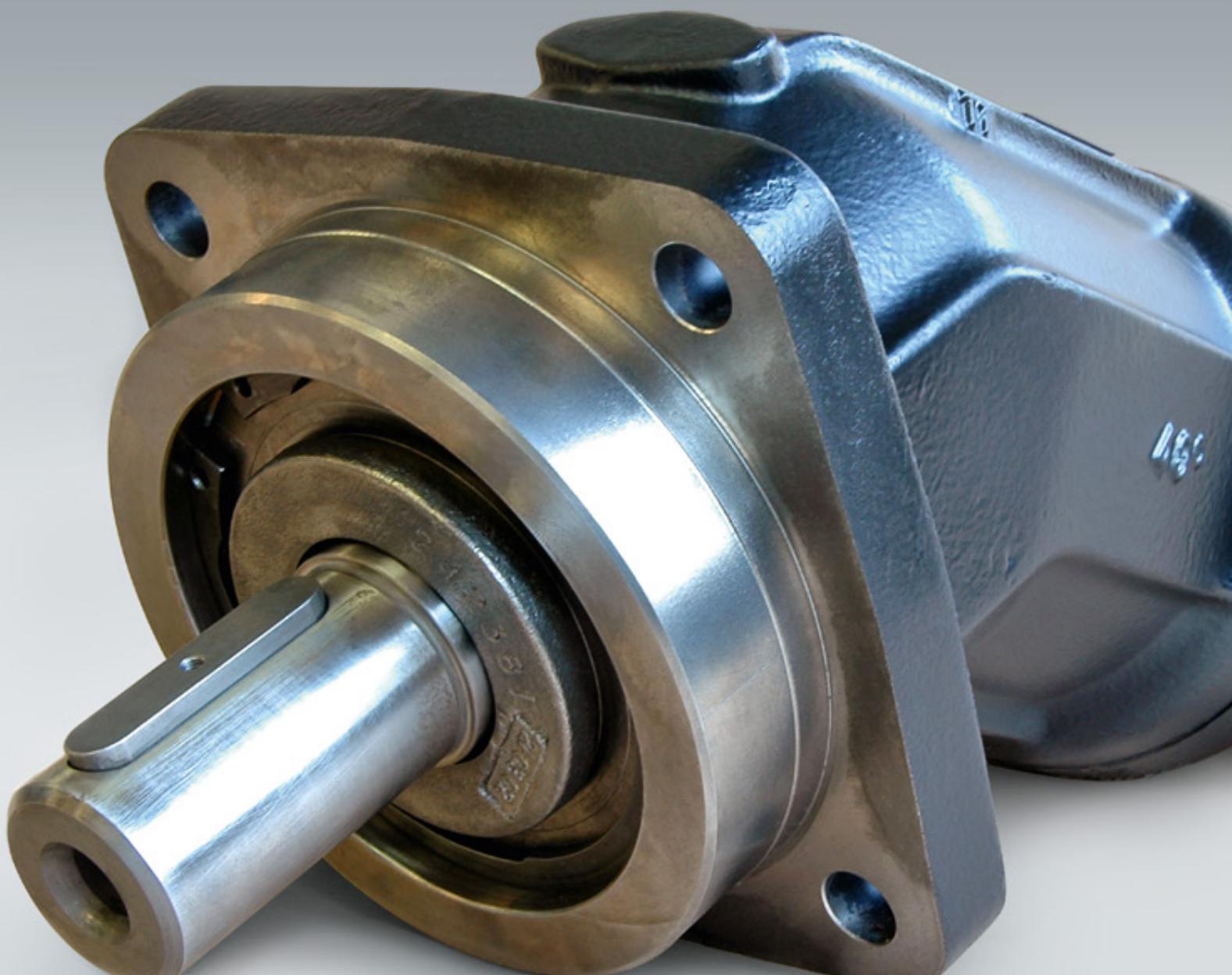
# VI. Small pneumatic and hydraulic components

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1. Hoses/hydraulics

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2. Gaskets





## 1. Hoses/hydraulics

**We offer maintenance services for hydraulic components, and not just for rail vehicles.**

Our range of services also includes inspecting hydraulic pumps and motors up to test pressures of 300 bar, checking hydraulic cylinders up to 200 bar, hydraulic variable displacement pumps and overhauling complete cooling systems. We also offer cleaning and maintenance of cooling water, oil, intercooler and hydraulic pumps as well as hydraulic motors.

- Repairing and overhauling of hydraulics
- Preliminary and ultrasound cleaning
- Cooler leak tests
- Overhaul of thermostats and fans

Our service portfolio encompasses the following hydraulic components:

- Hydro motors
- Hydraulic motors
- Hydraulic pumps
- Hydraulic control units
- Hydraulic cylinders
- Hydraulic jacks, lift assemblies and presses for machine tooling
- Radiator systems
- Cooling water regulators (thermostats)
- Gas-hydraulic cartridges
- Fan propellers

In addition to hoses for hydraulic components, our maintenance portfolio also includes pneumatic, fuel, brake, cooling water and drinking water hoses.

You profit from our years of experience in maintaining hydraulic systems, which allow us to offer a multitude of services of the highest quality.



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### Infrastructure

The DB Fahrzeuginstandhaltung maintenance depot in Kassel has its own production segment for carrying out work on hydraulics, and we make good use of our in-house hose manufacturing facility when repairing hose systems for hydraulic components. This enables us to offer new low, medium and high-pressure hoses of all lengths and with all necessary fittings in diameters ranging from 4 mm to 10 mm. The Bremen maintenance depot is also equipped with a hydraulics workshop and a test rig for hydraulic pumps.

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### Certification

It goes without saying that all repaired hoses are given official DB type approval and can be accompanied by a DIN 50049, EN 10204 or ISO quality inspection certificate.

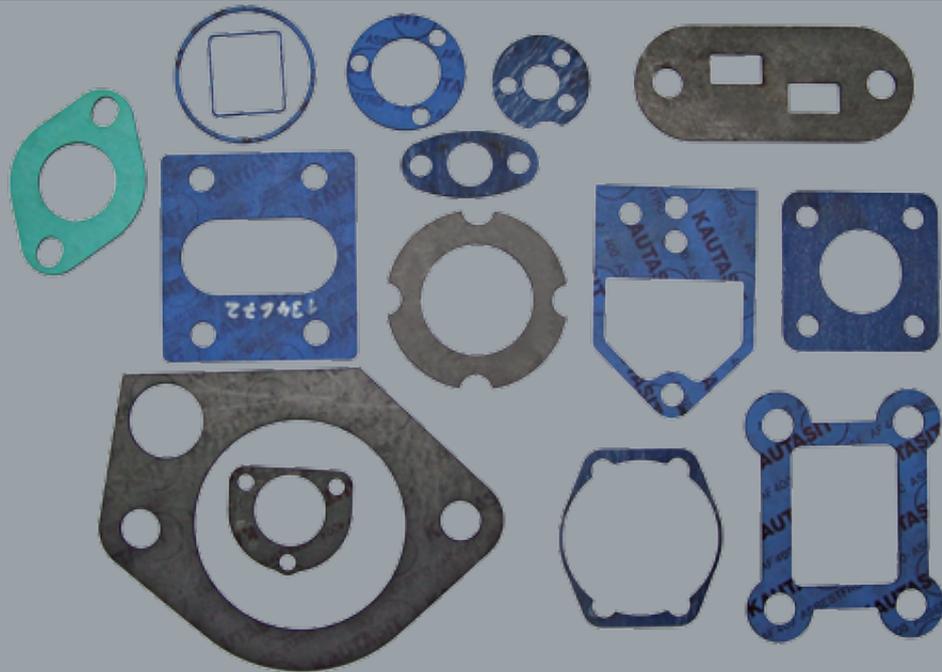
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## 2. Gaskets

**We manufacture gaskets and cut-to-size parts that are needed in large numbers to maintain rolling stock and components.**

Another of our specialist services is fabricating full face gaskets from a wide range of materials.

Included in our portfolio:

- Punched full face gaskets made from rubber or leather, for example
- Customised, laser-machined full face gaskets and cut-to-size parts (Klingersil, Frenzelit, AF 400 [Kautasit], bonded paper, metal [up to 12 mm])

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### Infrastructure

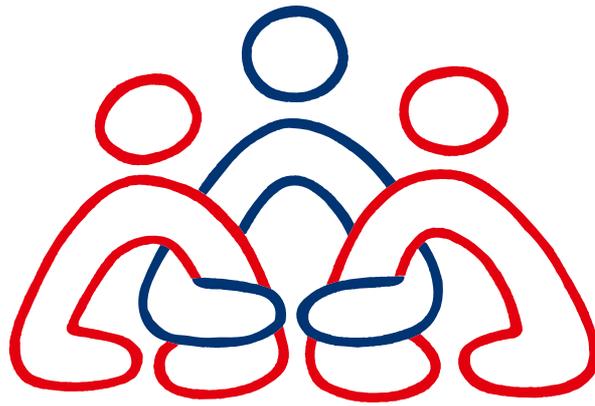
The Cottbus maintenance depot operated by DB Fahrzeuginstandhaltung offers the following equipment for manufacturing components:

- Programmable laser-cutting system
- Gasket punch with comprehensive set of dies

---

### Contact

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## Service portfolio of workshops for disabled employees

As a company of Deutsche Bahn AG and a major employer at many locations around Germany, we are well aware of the role we play and the responsibility we have for ensuring the well-being of our employees.

For more than ten years, we have reserved more than 50 positions (2015) for employees with handicaps in workshops for disabled employees. Integrated in our corporate and maintenance structure, these employees throughout the country make their own special contribution and add value that benefits our organisation in many ways.

The services offered by our workshops for disabled employees are market compliant, forward looking and encompass several different areas, including:

- Rail-specific components
- Screen printing, digital printing, sign manufacturing
- Mast break switches, pressure protection valves, fire extinguishers
- Horns, all types of stamps, pulse generators
- Fire extinguishers, metal construction, tail end indicators
- Rail clips, magnetic track brakes, articulated electromagnets

Numerous certifications and audits document our quality demand on our services. As of 2004, for example, the workshops for disabled employees have been DIN EN ISO 9001 compliant and have acquired all the certificates required to carry out special inspection activities. Many customers of Deutsche Bahn and other railway operating companies have placed their trust in the quality, expertise and reliability of the services provided.

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### Contact

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Workshops for disabled employees  
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