

**VOITH**

# Rail Service with Voith. Technical Improvements for Your Rail Vehicles





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### 1 Overhaul to maintenance

Voith offers a range of different service concepts for rail vehicles – from preventative maintenance to just-in-time concepts and overhauls during which downtimes are minimized. This is achieved by an exchange pool for components such as gear units that are delivered and installed in advance, while the old unit undergoes a general overhaul.

### 2 ICE 3 now even quieter

As a result of the overhaul and the technical improvement of 500 Voith gear units type SE-380, the noise emissions of the gear unit were significantly reduced in the ICE 3. Voith delivered the overhauled gear units to Deutsche Bahn within a ten-day cycle.

### 3 Smoother running for Itino

25 gear units type SK-460 as well as 25 type KE-460 gear units of Swedish Regional Railways were not just overhauled by Voith but technically improved. The result: the Itino trains now stand out by even quieter running.

# Voith Service for Rail Vehicles Worldwide

Instant spare parts availability or tailor-made service products, effective training programs or worldwide on-site service – these service aspects are of vital importance for rail vehicle operators. The employees of Voith Rail Service apply their know-how day after day, not only to restore the quality and the reliability of the drive components during maintenance and repairs, but also to develop the components further and actually improve them.

Being on site, knowing and understanding the problems of the customer, adapting to regional and individual operating conditions and integrating them in maintenance and service work – this is what distinguishes Voith as a modern service provider for rail vehicle operators. Apart from operators such as DB German Railways or Swedish Regional Railways, leasing companies like Alpha Trains are also convinced by this claim.

Classic Voith service contracts cover maintenance, overhauls and repairs. The fleet of Alpha Trains with over 700 vehicles is an example of this. A framework contract signed with Alpha Trains for more than 200 vehicles covers Regio Shuttles with Voith DIWA transmissions, mainline locomotives (G1700 and

G2000) with Voith turbo transmissions, shunting locomotives (G1206 and G1000) with Voith turbo reversing transmissions, as well as EMU Flirts with Voith gear units. Voith cooling systems are also part of the service contract. In order to fulfil this contract, the vehicles are examined and repaired on site by Voith employees, while some repairs or major component overhauls are carried out in Voith workshops.



### **Different Service Concepts**

In order to minimize the downtimes of the entire fleet, Voith sets up a suitable overhaul plan with the customer, which indicates when components are being removed and during which period they are being overhauled, examined, tested and then returned with appropriate warranties.

Just-in-time concepts specify precisely defined time slots, during which Voith will make the serviced drive components available again. Voith has, for example, delivered between 8 and 23 overhauled gear units of the ICE 3 trains to Deutsche Bahn per week. As a result, their availability increased by 30%.

Preventive overhauls reduce the risk of unscheduled vehicle downtimes. For condition-related maintenance solutions, customers can normally opt for minor overhauls, which offer significant cost advantages over major overhauls. Maintenance costs can thus be reduced by approximately 25%. Should the minor overhaul, during which drive and intermediate bearings are exchanged, reveal the necessity of repairs, the customer will be notified accordingly. The minor overhaul might then become a major overhaul with all the advantages

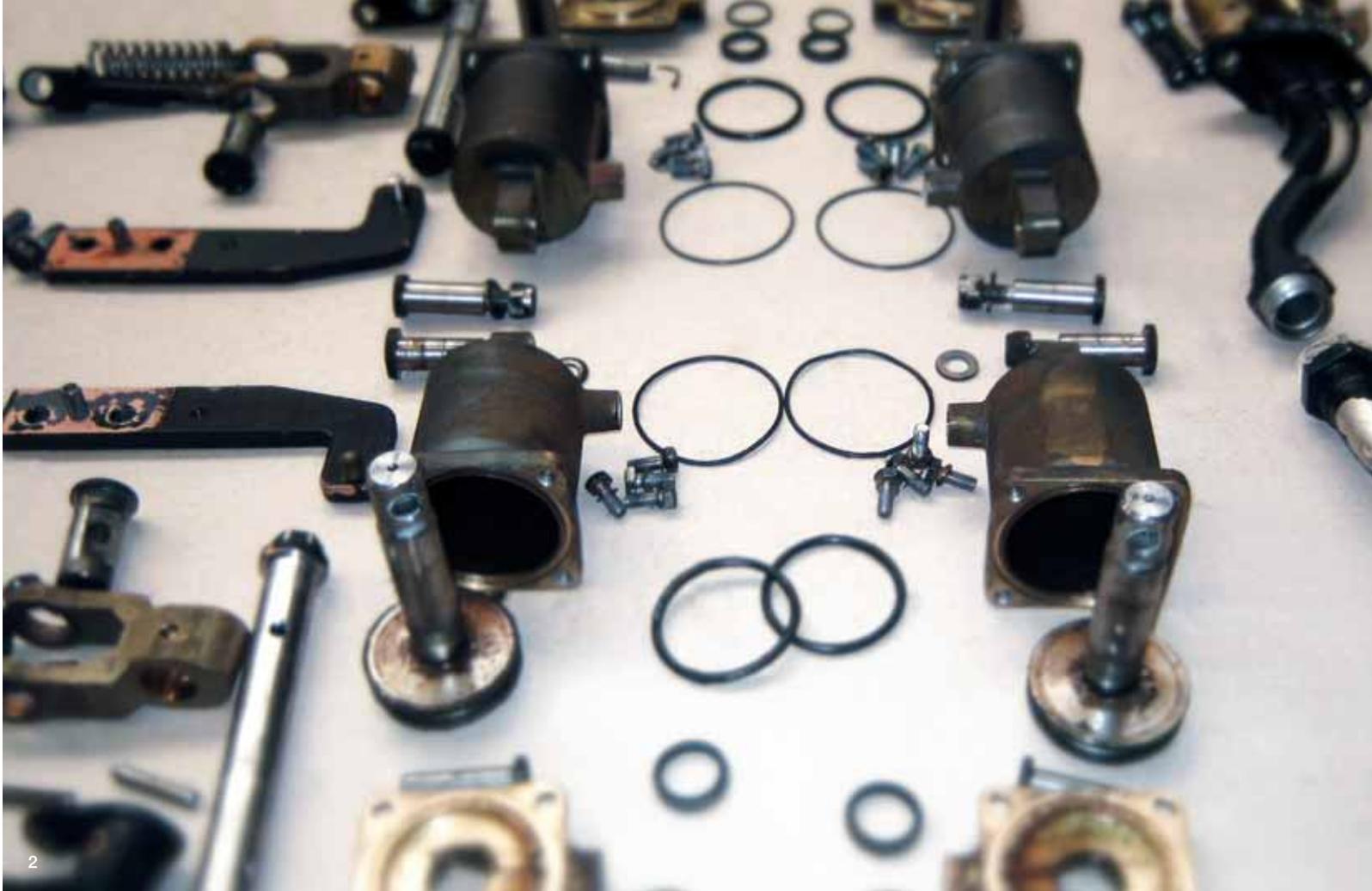
of longer mileages and extended warranties for the Voith drive components in the vehicle.

### **0-Days Delivery with Exchange Pool**

Voith also offers its customers the option of an exchange pool. As part of a planned revision or an unscheduled repair of their vehicles, rail operators can ask Voith to deliver generally overhauled gear units in advance and install them directly. As a result, there are no standstill or delivery times. Voith then overhauls the used gear units, making them available to the next customer who uses the same type of unit as a 1:1 exchange from the gear unit exchange pool. The transport company Bernmobil of the city of Bern is already totally convinced of this concept. During 2012 and 2013, Voith delivered a total of 120 exchange gear units for 15 low-floor tramcars type Combino.

### **Overhauled to the Latest Technical Standards**

As part of its ongoing product development policy, Voith offers another service advantage. Whenever Voith components are being removed and sent on for overhaul, the customer receives them back with the latest technical improvements. An example are the Stadler Flirt vehicles. Voith has developed a new bearing for the SZH-595 gear units used in this vehicle, which is



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significantly more resistant to higher temperatures (locally to up to 600 °C) and thus act against wear. In principle, Flirt customers receive a new gear unit from Voith as part of the overhaul that did not exist in this form when the unit was first installed.

### Joint Inventory

Voith service components offer perceptible customer advantages. The conditional assessment for rail vehicle operators is proof of this. For example, prior to starting with its major overhaul work, Voith offers customers of Scharfenberg couplers to dismantle the couplers professionally and assess them jointly. During this process, Voith employees explain in detail what needs to be refurbished and which technical improvements (keyword: further development) can be implemented. Last but not least, this process also points out possible cost savings achieved by alternative repair measures.

### 1 Exchange transmissions keep Bern mobile

The operator Bernmobil of the city of Bern utilizes the exchange gear unit pool from Voith. For 15 low-floor tramcars type Combino, Voith delivered a total of KEH-345 exchange gear units during 2012 and 2013.

### 2 Coupler success

RENFE, Ned Trains, Ütli Bergbahn or Kölner Verkehrsbetriebe (KVG) – the condition of their couplers was examined as part of a conditional assessment in a Voith workshop together with Voith service technicians. Only then are the couplers repaired and, in many cases, technically enhanced.



Voith gear unit SZH-595



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### 1 Service and repairs

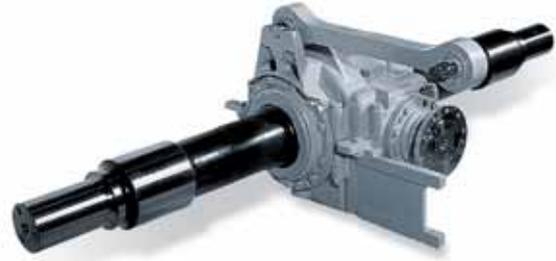
At the location Kiel Voith combines the maintenance of a locomotive with the repair of an accidental damage.

### 2 Service contract for leasing fleet

More than a third of the leasing fleet of Alpha Trains with its over 700 vehicles is being serviced by Voith. They include Regio Shuttles with Voith DIWA transmissions, mainline locomotives (G1700 and G2000) with Voith turbo transmissions, shunting locomotives (G1206 and G1000) with Voith turbo reversing transmissions, as well as EMU Flirts with Voith gear units.

### 3 Service for tilting technology

The high-speed trains with tilting technology (ICN) of Swiss Federal Railways also rely on Voith drive technology. As part of the maintenance work, Voith was able to technically improve 450 gear units type KE-445.



Voith gear unit KE-445

## Comprehensive Service Concept for all Railway Traction Vehicles

Under the term "Systems Service" Voith offers a comprehensive service portfolio for all kinds of rail traction vehicles. Apart from locomotives, the portfolio includes railcars and entire multiple units. The modern service program covers a broad spectrum: from systems integration and type approval of additional components, the exchange of complete bogies and general vehicle overhauls to the continuous monitoring and documentation of vehicle fleets with own software tools.

A portfolio that offers clear advantages for vehicle operators: higher availability and reliability, value retention and/or value increase, or an improved eco balance. Especially this aspect plays an ever increasing role in these service tasks. Voith offers, for example, adaptations for the subsequent compliance with new exhaust regulations or for the reduction of noise emissions inside or at the vehicle. Until recently, vehicle operators had to consult several individually specialized service companies, in order to integrate a drive system into a regional DMU and obtain the required approval. Voith provides this service from one single source. If desired, Voith also carries out the production of prototypes or series modifications.

## Voith has demonstrated this service competency for numerous customers:

- + **Engineering:**  
Systems integration and engineering of a new drive system in a regional multiple unit in the UK.
- + **Major Overhaul of Complete Vehicle and Major Overhaul of Bogies:**
  - Major overhaul with simultaneous accident repair at MH05 locomotives of the customer Thyssen.
  - Major overhaul for bogies of the ER20 locomotives of the customer Northrail.
- + **Service:**  
Condition-related service and maintenance on site at HVLE.
- + **New Construction:**  
Production of cooling systems for the customer Sinara.

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Voith Turbo, a Group Division of Voith GmbH, is a specialist for intelligent drive solutions. Customers from highly diverse industries such as oil and gas, energy, mining, mechanical engineering, ship technology, rail and commercial vehicles rely on advanced technologies from Voith Turbo.

Voith sets standards in the markets energy, oil & gas, paper, raw materials and transportation & automotive. Founded in 1867, Voith employs more than 39,000 people, generates €5.3 billion in sales, operates in over 50 countries around the world and is today one of the biggest family-owned companies in Europe.

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