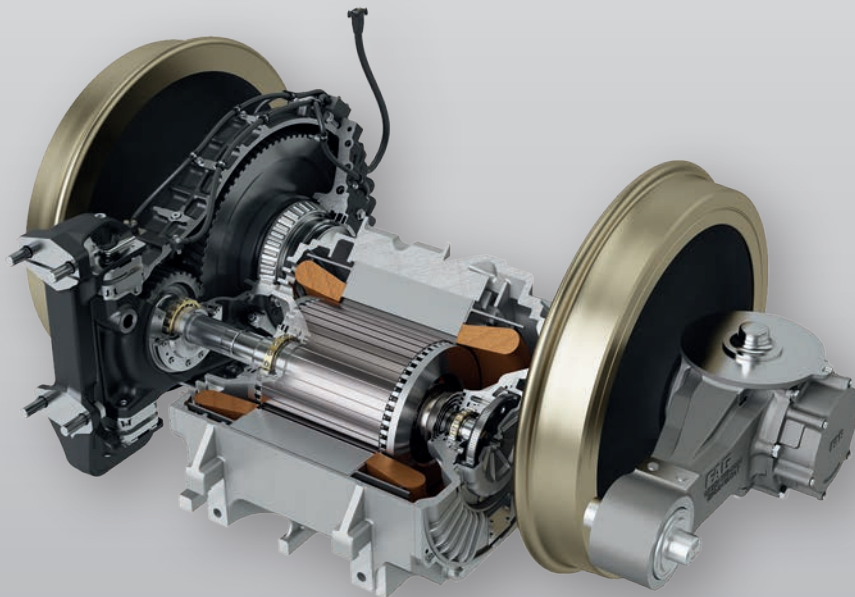


Rolling bearings
Plain bearings
Linear technology

FAG

Complete Wheelset

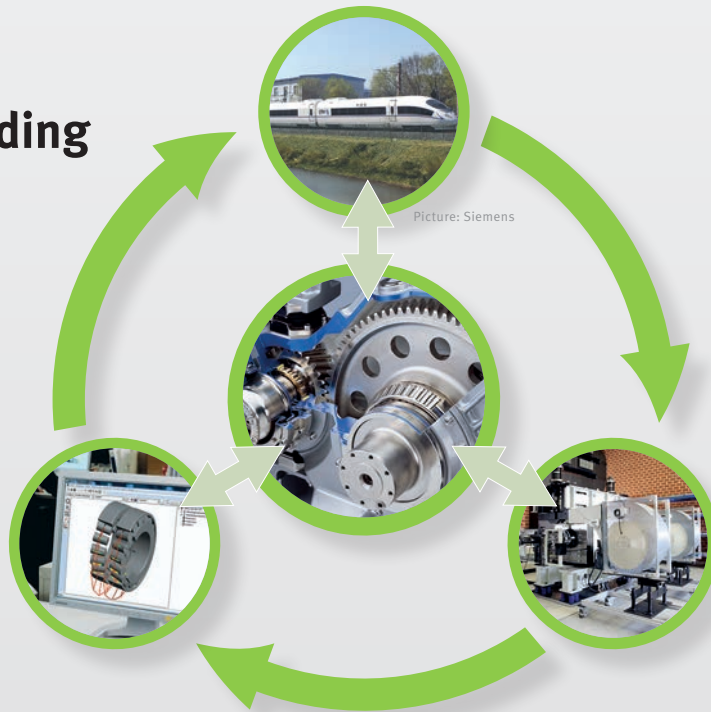
BETTER COMPONENTS THROUGH SYSTEM UNDERSTANDING



MOBILITY FOR TOMORROW

SCHAEFFLER

System Understanding



Advantages

- Efficient and reliable drive components for rail vehicles
- Increased cost effectiveness and safety in rail transport
- Predictive maintenance: higher average speeds, greater service performance, longer maintenance intervals, and prevention of unplanned downtimes

Features

- Product innovations such as further developed FAG tapered roller bearings and cylindrical roller bearings for gearboxes, FAG deep groove ball bearings and cylindrical roller bearings for preventing the passage of current in the traction motor and wheelset bearing units
- Rail-specific condition monitoring systems with cloud connectivity
- Solutions for reconditioning

Complete Driven Wheelset

Product characteristics

The complete wheelset shows the broad product range Schaeffler offers for the drive systems of rail vehicles

Functional advantages

- Adapted bearing components for rail vehicle drives
- Application-specific cage design for axlebox bearings, tapered roller bearings, and cylindrical roller bearings
- Current insulation for traction motor bearings
- TAROL axlebox bearings for long operating intervals
- Axlebox bearing housings developed for special applications

Product benefits

- System understanding leads to components designed for the application
- The added value lies in the reliable function of the components thanks to our broad system understanding

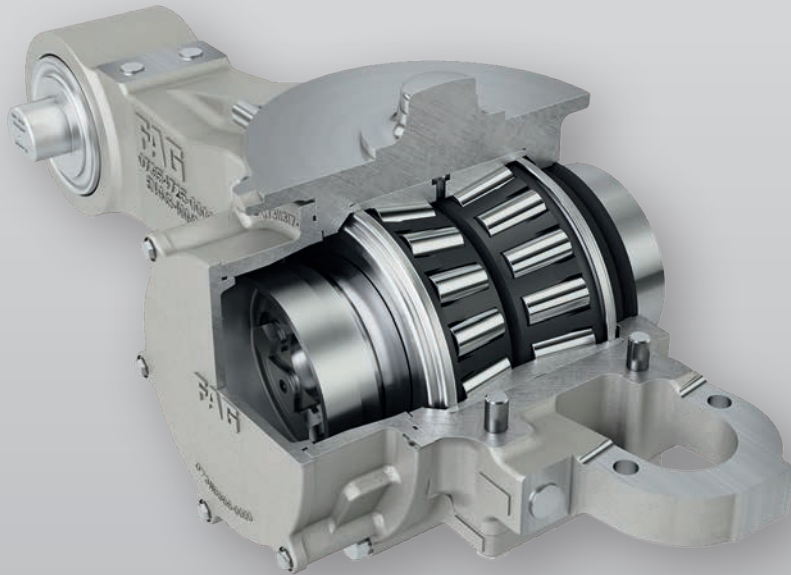


Rolling bearings

Plain bearings

Linear technology

AXLEBOX BEARING ARRANGEMENT



Axlebox Bearing Arrangement

Product Characteristics

- Axlebox bearings manufactured and tested according to EN12080
- Use of proven greases according to EN12081
- Performance tested according to EN12082 on special test stands
- Improved load-carrying capacity through optimum material, heat treatment, and internal contact geometry
- Ready-to-install bearing unit with preset axial clearance and factory greasing
- Gap seal
- Axlebox bearing housing designed, calculated, and tested for the specific application

Functional advantages

- High load-carrying capacity and operating life
- High circumferential speeds and bearing limit speed (HST)
- Low bearing friction
- Robust and field-tested design
- Simple mounting

Product benefits

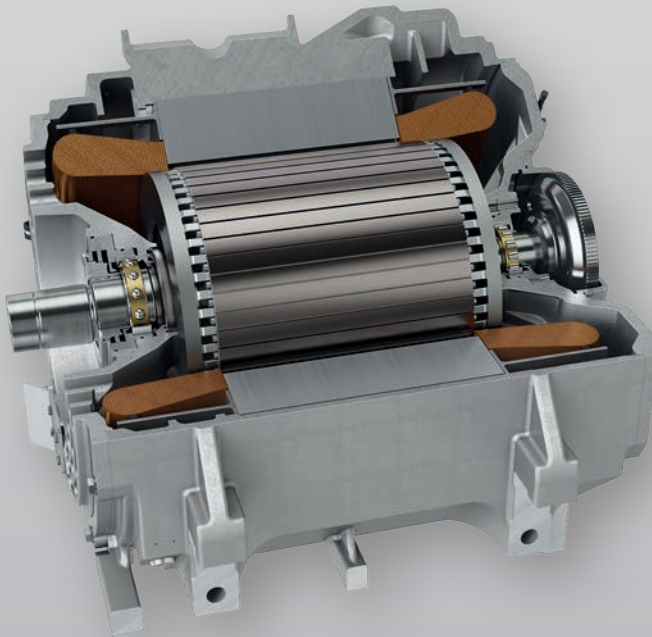
- Long bearing operating life
- High operational reliability
- Use in applications with high vibration and shock loads
- Use under all climate conditions, such as at low temperatures

Rolling bearings

Plain bearings

Linear technology

TRACTION MOTOR BEARING ARRANGEMENT



Traction Motor Bearing Arrangement



A unique feature of the traction motor bearing arrangements are current-insulated bearings as described below

Product Characteristics

- Bearings are lubricated with grease while in use
- Designed as a fixed/non-locating bearing combination
- Ceramic coating on the outer ring / inner ring, or alternative: fully ceramic rolling element
- Same dimensions and tolerances as standard bearings
- Different coatings with various thicknesses

Functional advantages

- Layer thickness $\geq 200 \mu\text{m}$, offering good capacitive resistance
- Insulation up to 3000 V DC

Customer benefits

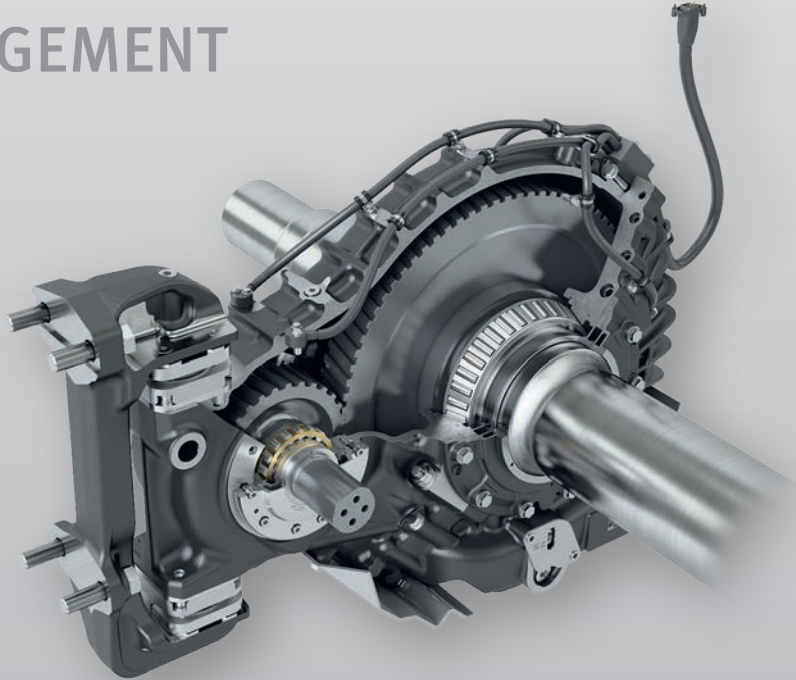
- High wear resistance
- Good heat dissipation
- Can be retrofitted because the standard size is easily replaceable, allowing for better insulation
- Longer useful life of bearing
- Increased operating life of lubrication greases when ceramic rolling elements are used
- Reduced maintenance costs

Rolling bearings

Plain bearings

Linear technology

TRANSMISSION BEARING ARRANGEMENT



Transmission Bearing Arrangement



Product characteristics

- Bearings in X-life design
- Cages optimized for rail applications
- For use in temperature ranges up to 200 °C

Functional advantages

- Robust design
- Suitable for very high speeds
- Low bearing friction
- High dynamic and static cage rigidity

Customer benefits

- Use at high speeds
- Lower operating temperature
- Use in applications with high vibration and shock loads
- Long bearing operating life
- High operational reliability
- Localization for target markets