GGB
BY TIMKEN

GGB® Plain Bearings and Coatings for Off-Highway Applications

Reliable Solutions for the Off-Highway Industry

Designing off-highway equipment poses significant challenges due to the harsh and demanding conditions these vehicles face. Engineers must consider extreme environmental factors such as high moisture levels, broad temperature ranges, and constant exposure to contaminants like dirt and debris. The equipment must often endure heavy loads, frequent shocks and vibrations, and irregular maintenance schedules. Ensuring durability and reliability is critical, requiring innovative solutions in materials, coatings, and lubrication systems to achieve long-term performance and prevent costly equipment failures.

Drawing on extensive experience and specialized knowledge in the off-highway sector, GGB materials deliver high-quality performance for diverse applications in mining, construction, forestry, agriculture and more. Durability and reliability are crucial when selecting off-highway bearings, as equipment failures can be catastrophic in the field. GGB understands that customers require top-tier components to ensure their equipment operates efficiently in extreme conditions, including exposure to moisture, temperature fluctuations, and contaminants.

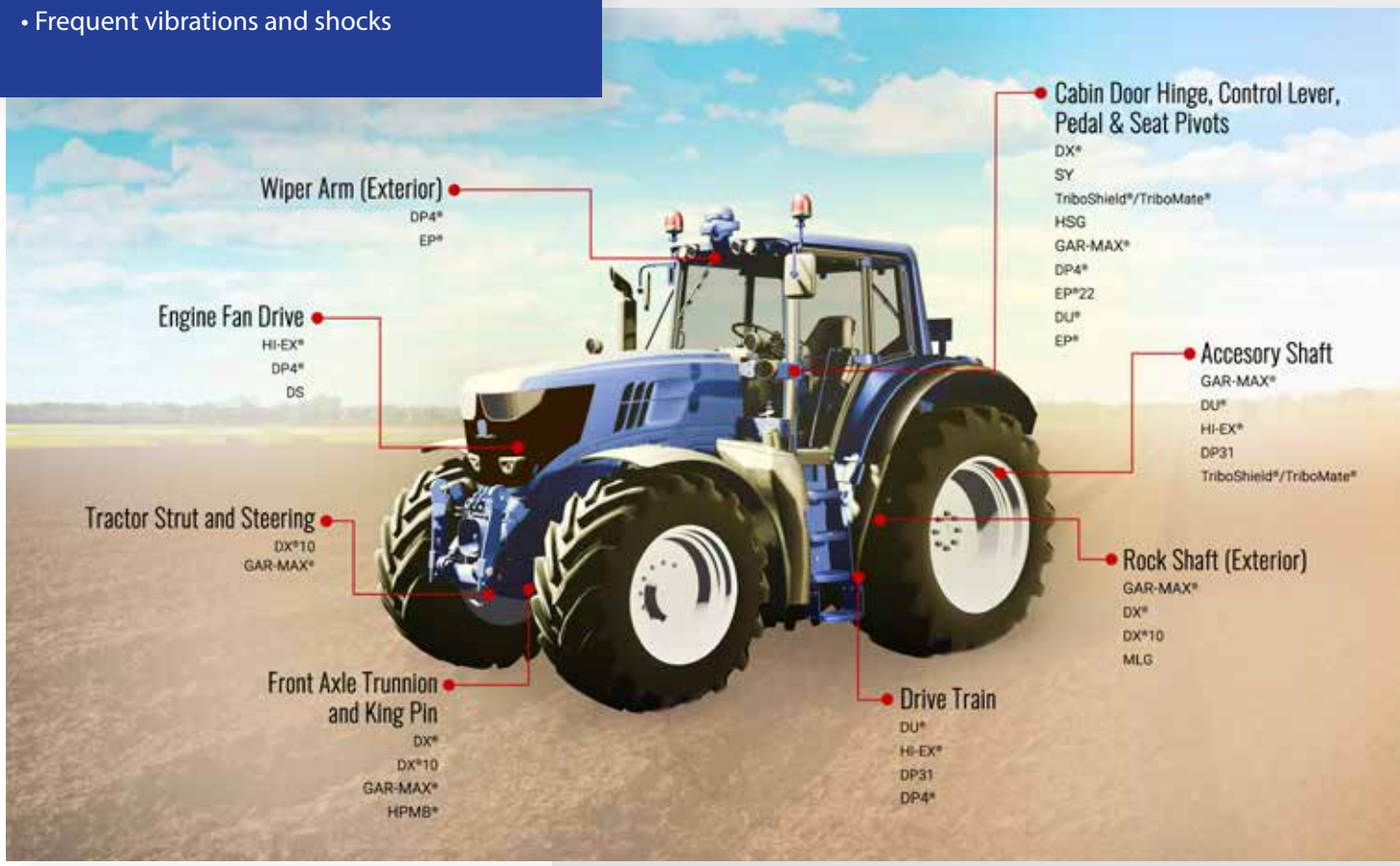
Designing off-highway equipment requires overcoming harsh conditions like extreme moisture, temperature fluctuations, and constant contaminants, making durability and reliability essential. GGB's materials deliver high-quality performance to meet these challenges across industries.

Agriculture Equipment

Agriculture Challenges

- Unexpected downtime
- Harsh operating environments
- Inadequate or improper lubrication
- Managing heavy and high shock loads
- Increasingly strict environmental regulations
- Frequent vibrations and shocks

- Tractors
- Tractor attachments
- Cultivator, baler
- Wagon or trailers
- Rotary tiller
- Harrow (disc, chain, roller)
- Plow (moldboard, disc)
- Mower
- Dozers
- Seeder, planter
- Fertilizer spreader

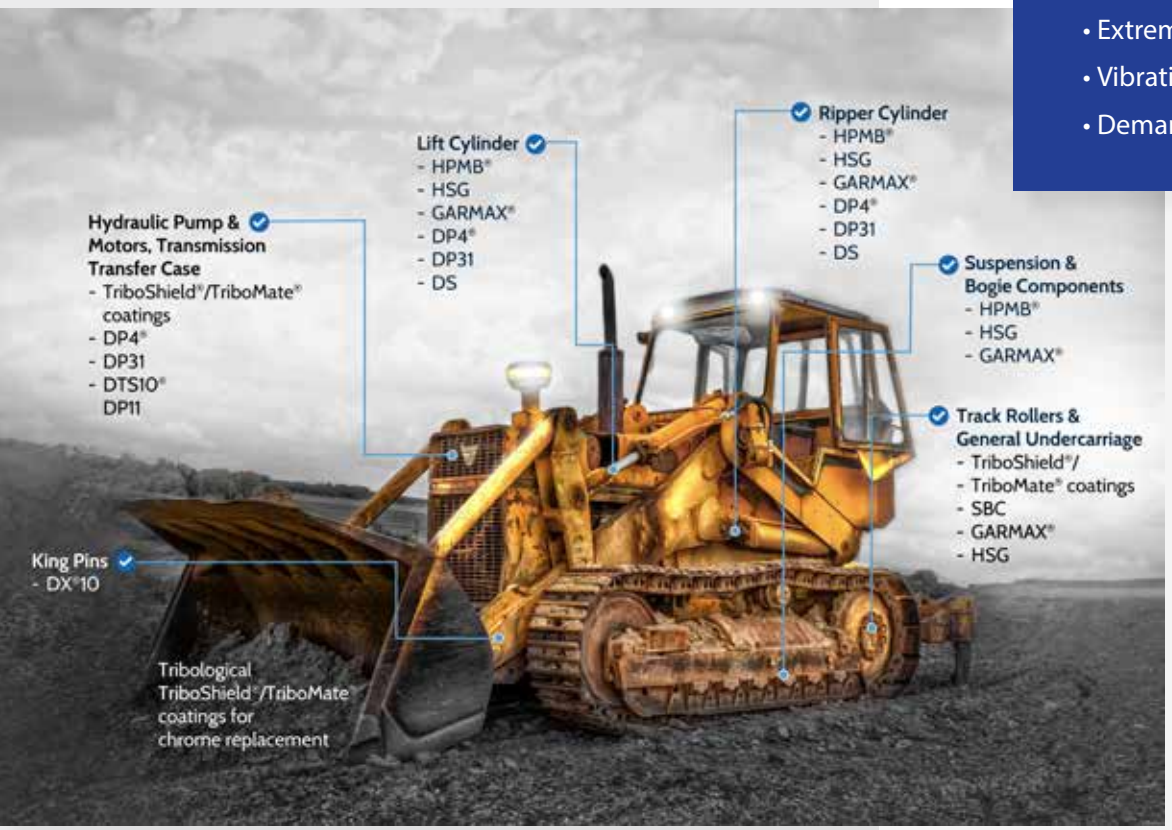


Construction Equipment

- Dump Trucks
- Bulldozers
- Excavators
- Wheel loaders
- Cranes
- Pavers
- Backhoe loaders
- Boom Lifts
- Rollers
- Forklifts

Construction Challenges

- Heavy loads and high stress
- Exposure to dirt and debris contaminants
- Corrosive and wet environments
- Extreme temperature fluctuations
- Vibrations and shock loads
- Demands for minimal downtime

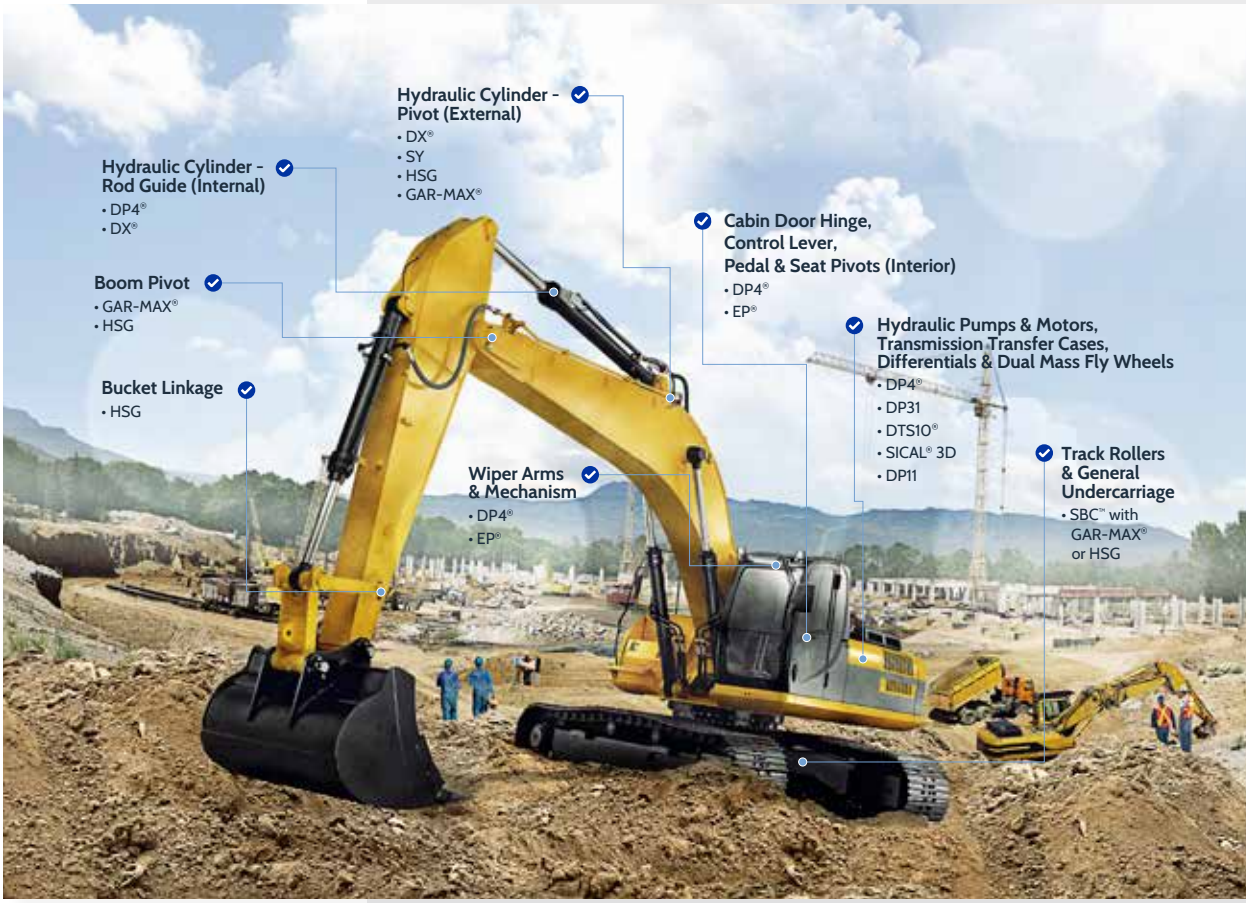


Mining Equipment

- Motor grader
- Pipelayer
- Wheel tractor scraper
- Track-type skidder
- Wheel loaders
- Tractors
- Compactor
- Excavators
- Bulldozers

Mining Challenges

- Extreme & high shock loads
- Corrosive environments
- Harsh environmental conditions
- Demands for minimal downtime
- Increasingly stringent safety regulations
- Increased friction leading to higher energy consumption



RECOMMENDED PRODUCTS

The following products are particularly well suited for off-highway applications*.
Contact your sales representative for bearing product selection and design assistance.

**Performance depends on different operating conditions*

Metal Polymer Bearings

Metal-Polymer bearings offer superior anti-friction and wear-resistant properties to traditional metal bushings, capable of operating dry or with external lubrication, and deliver exceptional performance through their unique composite structure. The excellent low friction and high wear resistance of GGB Metal-Polymer bearings make them ideal for hundreds of applications across a wide range of industries.

DU®
- Lead metal-polymer self-lubricating bearing
- Excellent wear and low friction performance across a wide range of loads, speeds, and temperatures in dry conditions
- Also suitable for lubricated applications

DP4®
- Lead-free metal-polymer material
- Low friction and excellent wear resistance in dry and lubricated applications
- Offers good performance in lubricated and greased applications

DP31
- Lead-free metal-polymer hydrodynamic composite bearing
- Excellent low friction and wear resistance in lubricated applications
- Offers superior flow erosion and cavitation resistance

DTS10®
- Lead-free Metal-polymer bearing material
- Polymer-lined precision bearing for lubricated conditions offering low friction and high wear resistance that is designed to be machined on-site for tight tolerances
- Excellent low friction and wear resistance in lubricated hydraulic applications

DP11
- A lead-free metal-polymer bearing material
- Excellent wear and anti-friction performance across a wide range of loads, speeds, and temperatures in dry conditions
- Particularly suited for dry applications with high-frequency and low-amplitude oscillating movements

DS
- Self-lubricating metal-polymer bearing material designed for mixed film lubrication conditions
- Resistant to fretting corrosion damage to the shaft under low amplitude oscillating movements

DX®
- A marginally lubricated, metal-polymer bearing allowing reduced maintenance intervals
- Optimum performance under high loads and low speeds
- Suitable for linear, oscillating, and rotating movements

DX®10
- Lead-free heavy-duty metal-polymer bearing material
- Exceptional fatigue strength and wear performance
- Ideal for heavy-duty and harsh environments

Hi-EX®
- A marginally lubricated composite bearing material
- Good wear resistance under thin film conditions
- Available with non-indented overlay for hydrodynamic applications

Fiber Reinforced Composite Bearings

GGB's Fiber Reinforced Composites combine the excellent lubricating properties of filled PTFE (polytetrafluoroethylene) with the high strength and stability of epoxy-impregnated, wound glass fibers to meet the demand for high-load, self-lubricating bearings with low wear rates. This robust, high-strength line delivers the radial and axial strength required to support high bearing loads.

HPMB®
- A high-precision, fiber-reinforced composite bearing material
- Pre-machined bearings available for immediate installation
- Excellent shock and edge loading capacity

HSG
- High Strength GAR-MAX self-lubricating fiber reinforced composite bearings
- High static load capacity
- Excellent shock and misalignment resistance

GAR-MAX®
- Self-lubricating fiber reinfored bearing material
- Excellent shock and misalignment resistance
- Excellent contamination resistance

SBC with GAR-MAX®
- Sealed fiber reinforced composite bearings
- Excellent resistance to shock loading and misalignment
- High static load capacity

Metals and Bimetals

SY
- Bimetal plain bearings feature a steel backing with a bronze overlay
- Ideal for high specific loads with low-frequency oscillating motion
- Excellent fatigue resistance at elevated temperatures

Engineered Plastics Bearings

The stringent demands of today's high-performance equipment and systems necessitate bearings that can reliably operate under extreme conditions with minimal maintenance and reduced operating costs. GGB's Engineered Plastic Polymer bearings offer excellent wear resistance and low friction in both dry and lubricated conditions, making them suitable for a wide range of applications.

EP®
- Self-lubricating engineered plastic bearings
- Good performance in dry working conditions
- Corrosion resistant in humid/saline environments

Polymer Coatings

GGB's diverse polymer coating solutions feature some of the most advanced coating technologies available. Our TriboShield® product line includes seven standard formulations that span the full range of mechanical, thermal, and chemical capabilities offered by modern coating materials. These coatings can be applied to nearly any surface, regardless of shape or material, offering virtually limitless potential.

TriboShield®
With the TriboShield® technology, GGB can reduce the friction and extend the durability of any complex shaped part by coating the substrate with our special designed low friction paints.

TriboMate®

TriboMate® is specifically engineered to complement and enhance the performance of GGB's bearing and polymer coating products. By combining two tribological coatings or pairing a GGB plain bearing with a polymer coating, friction is significantly reduced, thereby extending the system's lifespan.

TriboMate®
Our TriboMate® technology is the pairing of a GGB bearing with a GGB polymer coating. The technology reduces significantly the static and dynamic friction, improves start and stop behaviors and increases load carrying capability.
**Performance depends on different operating conditions*

THE GGB ADVANTAGE

LOW FRICTION, HIGH WEAR RESISTANCE

Low coefficients of friction eliminate the need for lubrication, while providing smooth operation, reducing wear and extending service life. Low friction also supports the elimination of the effects of stick-slip or "stiction" during startup.

LOWER SYSTEM COST

GGB bearings can help to reduce shaft costs by eliminating the need for hardening and machining grease paths. Their compact, one-piece construction provides space and weight savings and simplifies assembly.

EXTENDED SERVICE LIFE

GGB bearings deliver reliable performance in demanding conditions, enduring heavy loads and harsh environments to extend the lifespan of diverse applications.

MAINTENANCE-FREE

GGB bearings are self-lubricating, making them ideal for applications requiring long bearing life without continuous maintenance, as well as operating conditions with inadequate or no lubrication

ENVIRONMENTAL

Greaseless, lead-free GGB bearings comply with increasingly stringent environmental regulations such as the EU RoHS and WEEE directives.

CUSTOMER SUPPORT

GGB's flexible production platform and extensive supply network assure quick turnaround and timely deliveries. In addition, we offer local applications engineering and technical support.

GLOBAL FOOTPRINT

GGB has manufacturing, sales, service and support locations around the globe. This vast network of resources and expertise enables us to respond promptly to your bearing needs wherever you do business.

GGB BY TIMKEN

www.ggbearings.com

Stronger. **Together.**

Order-No. 11724 IN911ENG08-24USA

Stronger. Together.

With our extensive global presence and deep expertise in various applications, our capabilities are pushing the boundaries. We strive to expand the horizons of what's achievable, encouraging customers from all industries to collaborate with us and foster innovation together.

Today, our products can be found everywhere – from scientific vessels at the bottom of the ocean to racecars speeding down the tarmac to the Curiosity rover exploring the surface of Mars.