



SKF Explorer steel/steel plain bearings for off-highway applications

Lubricated-for-life to reduce operating costs and minimize environmental impact



An alternative



to daily relubrication

Frequent regreasing can be costly

In off-highway vehicles, steel/steel spherical plain bearings require relubrication on a daily or weekly schedule. While these regreasing routines extend bearing service life, they also increase operating expenses. Over time, the costs of frequent downtime, lost productivity, maintenance man-hours and new grease can be quite high.

Environmental risks can also be high, as the fresh grease pumped into the bearing during regreasing does little more than expel solid and liquid contaminants into the environment. The purged grease can leak into the soil – a particularly risky proposition at agricultural sites.

The SKF Explorer steel/steel plain bearing solution

Combining a virtually maintenance-free* design with the robust performance of conventional steel/steel spherical plain bearings, the new SKF Explorer steel/steel plain bearings offer a relubrication-free alternative to frequent regreasing.

For applications with low to moderate contamination levels, SKF Explorer steel/steel plain bearings have been proven to last significantly longer than conventional steel/steel spherical plain bearings, even when those conventional bearings are relubricated in accordance with recommended maintenance schedules. The result is extended vehicle maintenance intervals and bearing service life for reduced total cost of ownership (→ **diagram 1, page 5**).

Designed to perform on the jobsite

SKF Explorer steel/steel plain bearings feature high-grade, carbon chromium steel that is treated to minimize the risk of wear and corrosion. A non-toxic grease fills the bearing which is then sealed with steel-reinforced SKF LS heavy-duty triple-lip seals for high performance over long periods (→ **diagram 2, page 5**). The resulting tribological system is so robust that relubrication is unnecessary. For end-users, eliminating manual relubrication requirements can increase uptime and productivity and help to prevent the poor lubrication conditions that can lead to premature bearing failures.

And in the marketplace

Able to handle higher loads while accommodating the same levels of misalignment as conventional steel/steel spherical bearings, SKF Explorer steel/steel plain bearings offer OEMs a drop-in solution to differentiate their designs – one that has been extensively field-validated and laboratory-verified. They also allow external sealing solutions to be simplified or eliminated entirely, while their integrated seals may eliminate the need to machine or grind seal contact surfaces on adjacent components.

Plus, extensive research and testing under extreme loads has resulted in increased dynamic load ratings for SKF Explorer steel/steel plain bearings, an increase of 50% when compared to conventional steel/steel bearings (→ **diagram 3, page 5**).

Benefits

OEMs

- Improved differentiation in the market
- Reduced operation costs for customers
- Reduced environmental impact
- Reduced warranty claims

End-users

- Reduced Total Cost of Ownership
- Reduced maintenance costs
- Reduced grease consumption
- Increased uptime
- Improved reliability
- Reduced environmental impact
- Retrofittable and interchangeable

* Maintenance-free, in this case, means that the bearing should not be lubricated prior to or during operation. However, despite the use of this term, you should still check the fit and function of this SKF product as part of a regularly scheduled maintenance programme.

Fit for construction, farming and forestry

Hydraulic cylinder rod ends and more

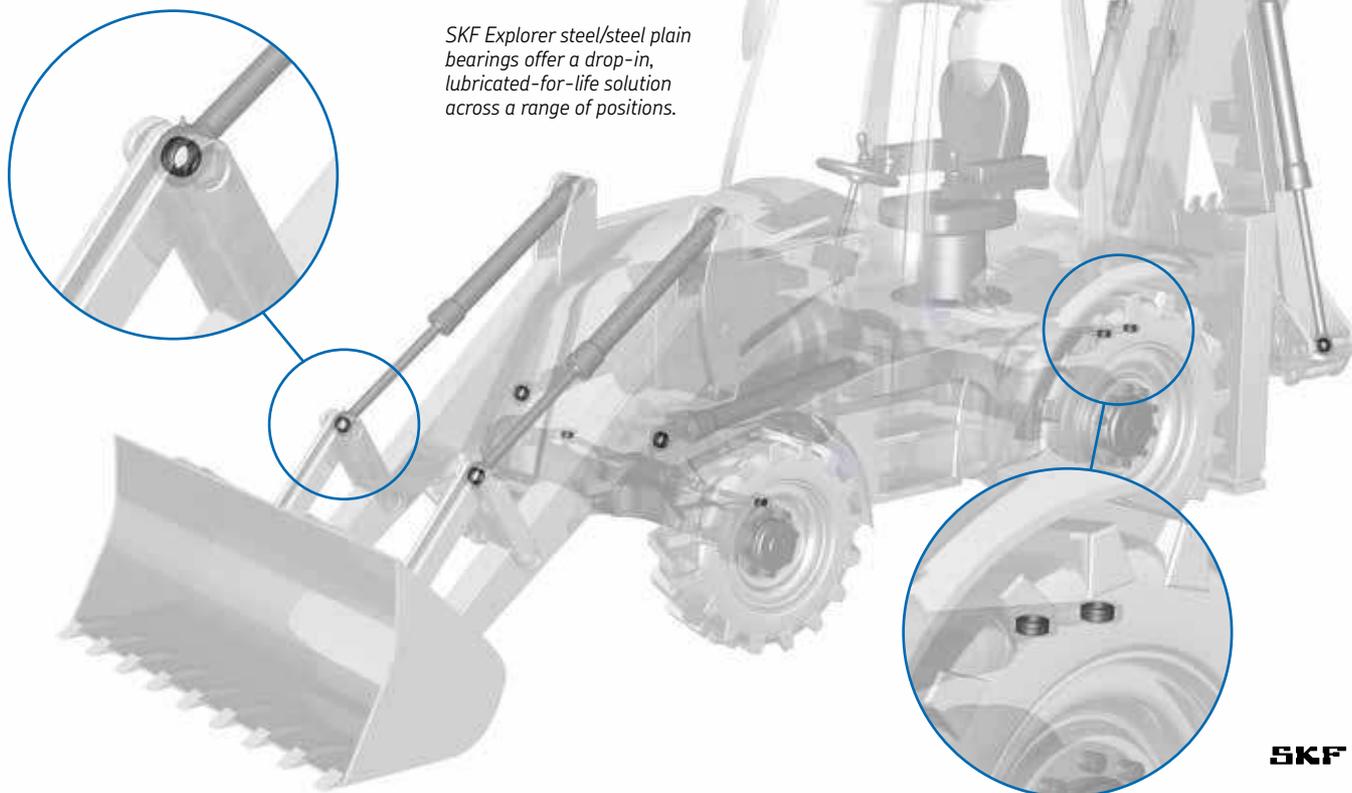
Along with allowing oscillation and tilting motions in hydraulic cylinders, SKF Explorer steel/steel plain bearings are suitable for pivot and other bearing positions in a range of off-highway machinery.

Typical applications

- Backhoe loaders
- Tractors
- Wheel loaders
- Motor graders
- Scrapers
- Articulated dump trucks
- Large mining trucks

Optimized field performance with SKF EnCompass

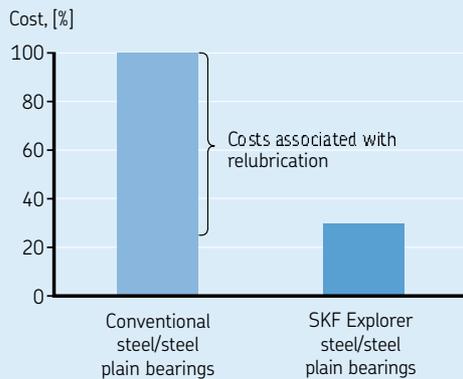
SKF EnCompass is a new field performance programme focused on bearing design optimization and more detailed analysis of the factors influencing bearing service life to help meet real-world application conditions. As part of the SKF EnCompass programme, SKF Explorer steel/steel plain bearings have been optimized to give you a field performance advantage.



SKF Explorer steel/steel plain bearings offer a drop-in, lubricated-for-life solution across a range of positions.

Field-tested, lab-verified performance

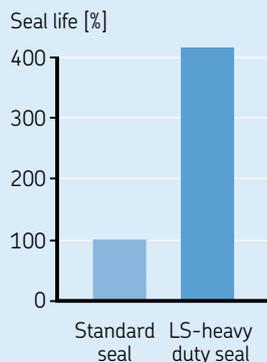
Diagram 1



Reduced total cost of ownership

SKF Explorer steel/steel plain bearings last significantly longer than conventional steel/steel plain bearings, even if those conventional bearings are relubricated in accordance with recommended maintenance schedules. And they require less maintenance to achieve their calculated life. Lubricated-for-life, SKF Explorer steel/steel plain bearings eliminate relubrication-related costs, while their longer service life means less downtime and reduced lost production due to repairs.

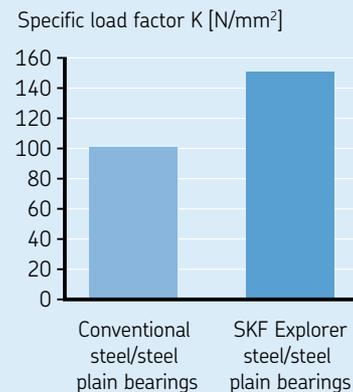
Diagram 2



Triple the seal life

Fabricated from oil and wear-resistant acrylonitrile-butadiene rubber (NBR) to help resist ageing, the LS heavy-duty triple-lip seal in SKF Explorer steel/steel plain bearings will last more than three times longer than standard seals.

Diagram 3



Increased dynamic load ratings

Extensive research and life testing has resulted in a dynamic load rating that is 50% higher compared to conventional steel/steel plain bearings with the specific load factor K being increased from 100 to 150 N/mm². This opens up a wider range of potential applications and the possibility for downsizing.

An optimized tribological system



Functional benefits

- Optimized lubricant effectiveness
- Reduced friction
- No fretting corrosion
- No stick-slip
- Reduced bearing failures as a result of poor lubrication

The bearing

SKF Explorer steel/steel plain bearings are made of high-grade carbon chromium steel that is hardened, ground and phosphated. Sliding surfaces are further treated to improve wear and fretting corrosion resistance. Non-separable, the bearing also features an optimized internal geometry, with an intentionally fractured outer ring that allows the inner ring to be inserted. The bearing is pre-filled with specially formulated non-toxic grease.

Dynamic load ratings

In line with established practice, the dynamic load rating for SKF Explorer steel/steel plain bearings has been determined from extensive research and life testing. The result is a dynamic load rating that is 50% higher compared to conventional steel/steel plain bearings with the specific load factor K being increased from 100 to 150 N/mm². This opens up a wider range of potential applications and the possibility for downsizing.

The seal

The integrated, long-life LS heavy-duty seals are fabricated from acrylonitrile-butadiene rubber (NBR), a highly wear and oil-resistant material that maintains its shape to provide excellent sealing performance. A triple-lip design virtually eliminates the ingress of contaminants into the bearing, while a stamped steel insert protects the seal lips from larger-sized contaminants (→ **fig. 1** and **2**). LS seals are suitable for operating temperatures ranging from -45 to 110 °C (-45 to 230 °F) and up to 125 °C (250 °F) for brief periods.

Fig. 1

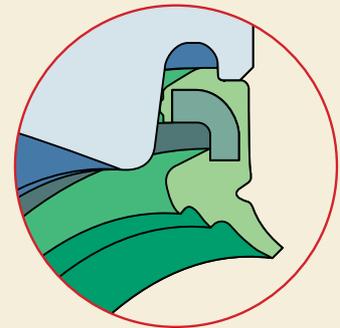
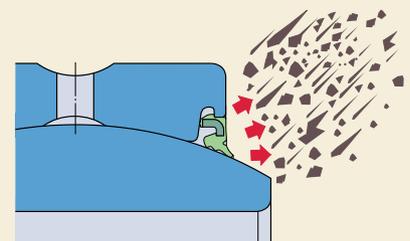


Fig. 2



Drop-in design flexibility



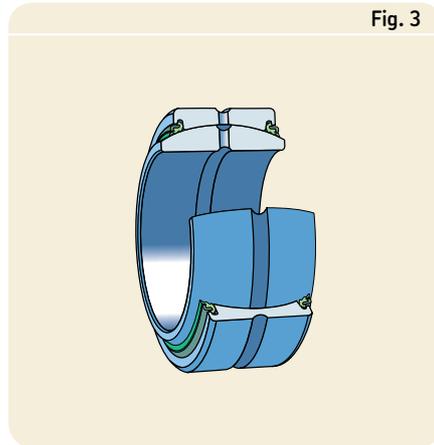
Fully interchangeable with conventional steel/steel plain bearing sizes, SKF Explorer steel/steel plain bearings enable trouble-free retrofits and contribute to enhanced next generation machine designs.

Bearing tolerances

SKF metric radial spherical plain bearings are manufactured to tolerances in accordance with ISO 12240-1. SKF inch radial spherical plain bearings are manufactured to tolerances in accordance with ANSI/ABMA Std. 22.2.

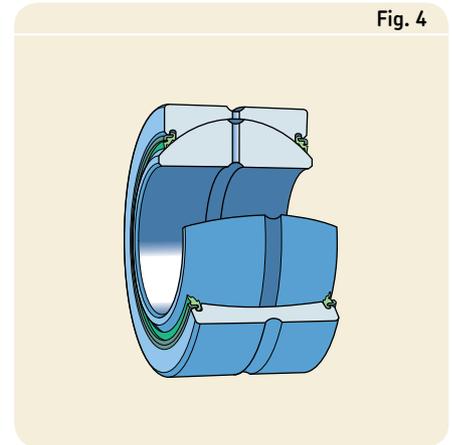
Bearing dimensions

See **fig. 3–6**.



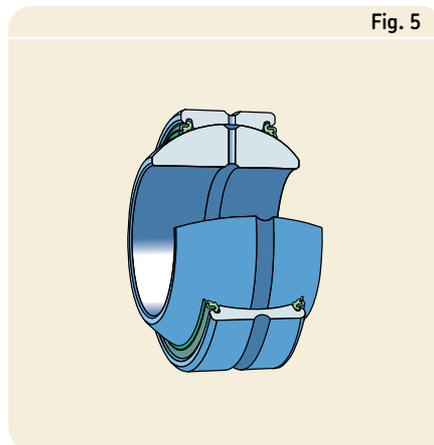
GE .. ESX-2LS

Metric radial spherical plain bearings.
Range: 20 to 300 mm bore.



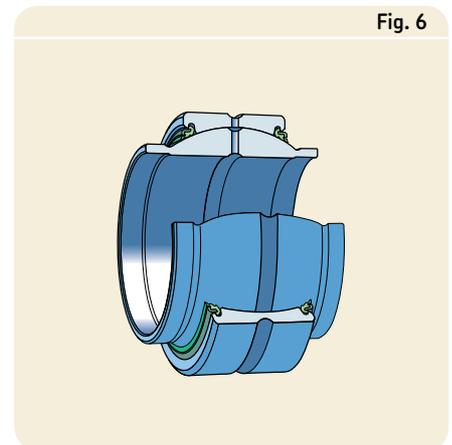
GEZ .. ESX-2LS

Inch size radial spherical plain bearings.
Range: 1 to 6 inch bore.



GEH .. ESX-2LS

Metric radial spherical plain bearings are of a similar design to GE .. ESX-2LS, but with a wider inner ring and a larger outside diameter. Range: 20 to 120 mm bore.



GEM .. ESX-2LS

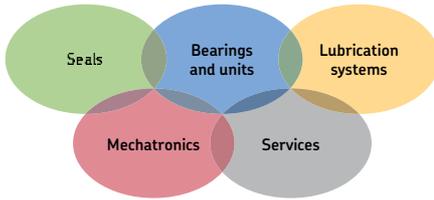
Metric radial spherical plain bearings are of a similar design to GE .. ESX-2LS, but with a cylindrical extension on both sides of the inner ring. Range: 20 to 80 mm bore.

GEZH .. ESX-2LS

Inch size radial spherical plain bearings are of a similar design to GEZ .. ESX-2LS, but with a wider inner ring and a larger outside diameter. Range: 1.25 to 5.5 inch bore.

GEZM .. ESX-2LS

Inch size radial spherical plain bearings are of a similar design to GEZ .. ESX-2LS, but with a cylindrical extension on both sides of the inner ring. Range: 1 to 6 inch bore.



The Power of Knowledge Engineering

Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.

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