

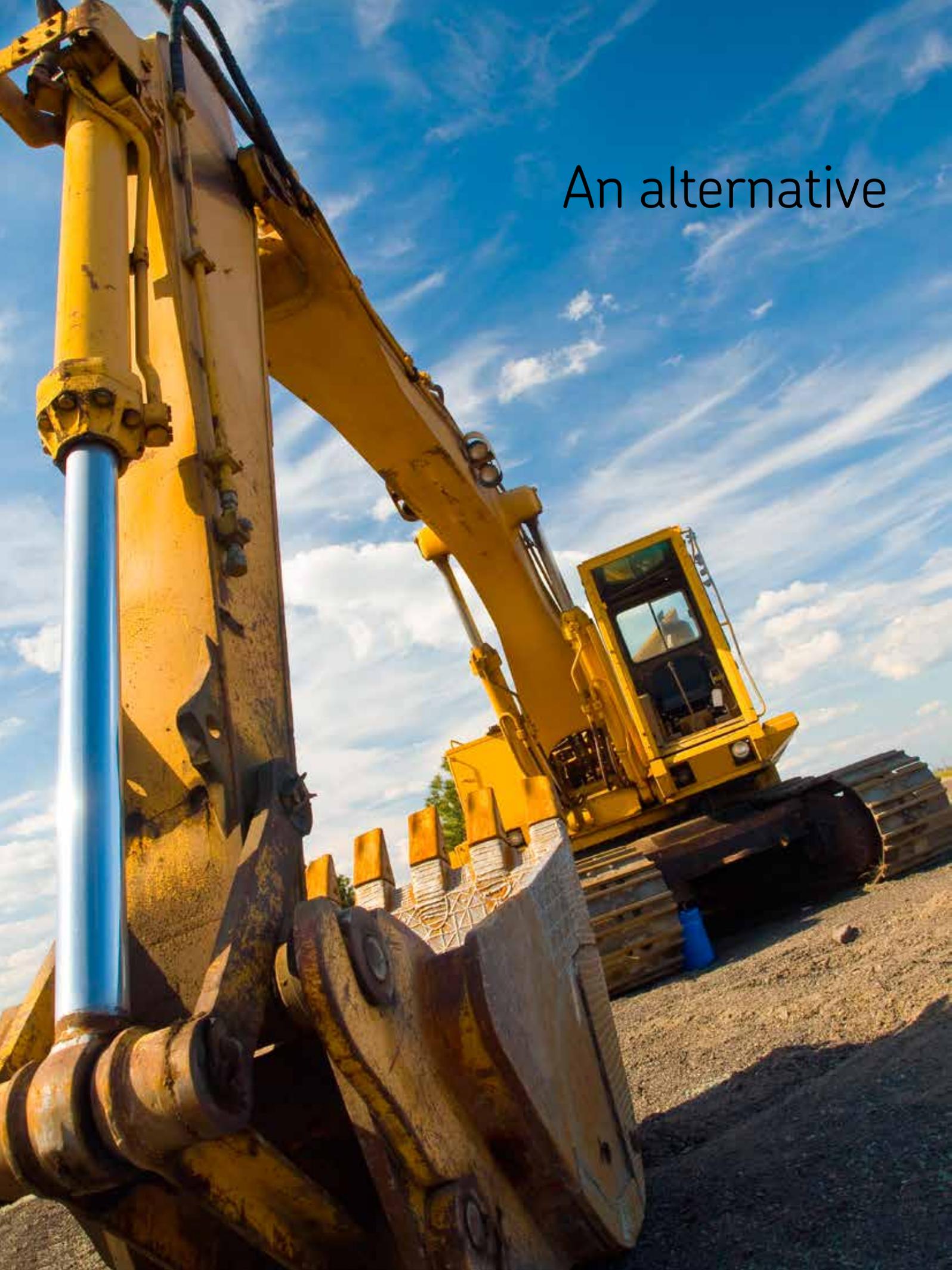


# SKF Extended Life Plain Bearings for off-highway applications

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 Extended Life Plain Bearing solution

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

For applications with moderate contamination levels, SKF Extended Life Plain Bearings will last at least as long as standard steel/steel spherical plain bearings, even if those standard bearings are relubricated in accordance with recommended maintenance schedules (→ **diagram 1, page 5**). The result is extended vehicle maintenance intervals and bearing service life for reduced total cost of ownership (→ **diagram 2, page 5**).

## Designed to perform on the jobsite

SKF Extended Life Plain Bearings feature high-grade, carbon chromium steel that is treated to reduce the risk of corrosion to a minimum (→ **diagram 3, page 5**). 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 4, 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 accommodate the same high loads and misalignment as standard steel/steel spherical bearings, SKF Extended Life 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.

## Benefits

### OEMs

- Eliminate relubrication requirements
- Reduce warranty costs by extending component service life
- Reduce environmental impact
- Differentiate machine designs
- Potentially reduce cost for external seals and/or machining

### End-users

- Reduce unplanned machine downtime caused by bearing failures
- Reduce or eliminate bearing maintenance
- Cut total ownership costs
- Eliminate relubrication-related failures

\* 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

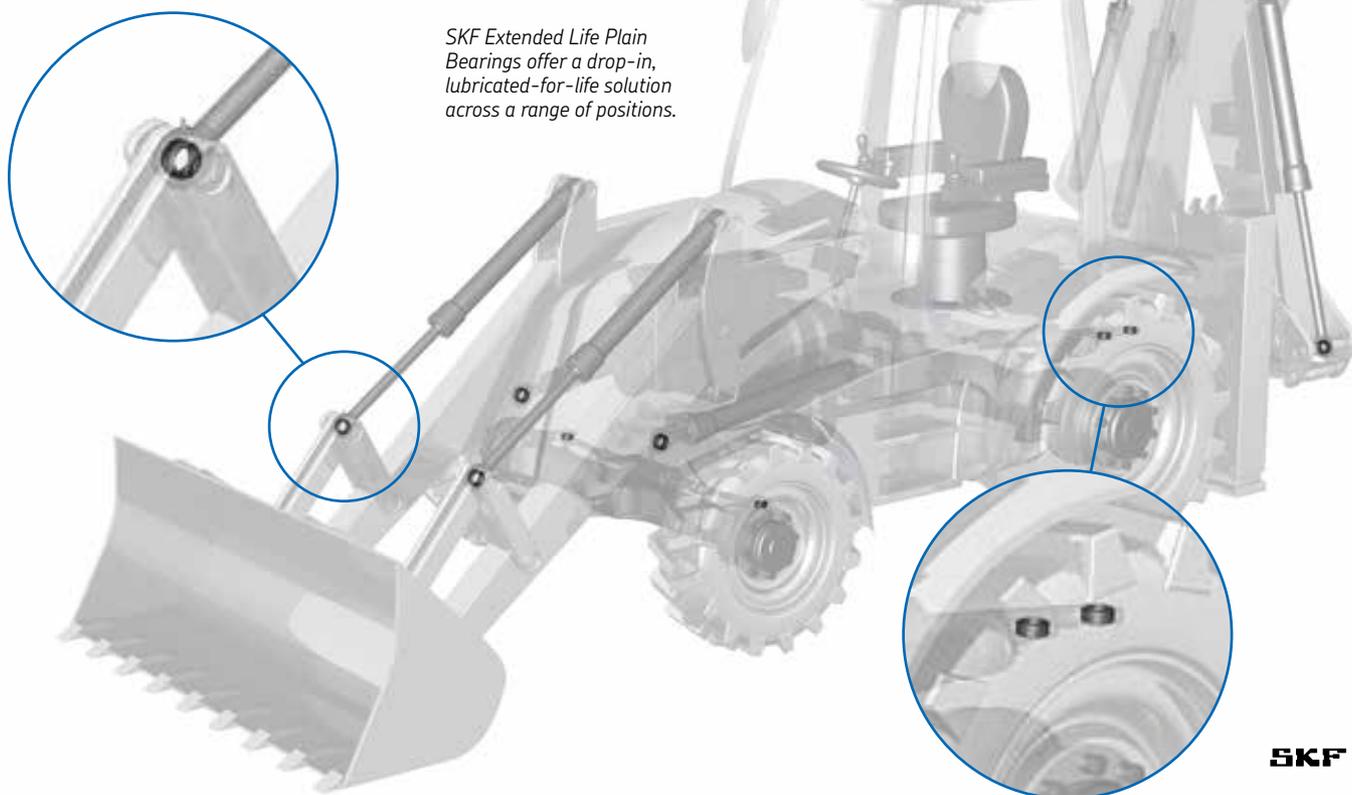
Along with allowing oscillation and tilting motions in hydraulic cylinders, SKF Extended Life Plain Bearings are suitable for pivot and other bearing positions in a range of off-highway machinery.

## Typical applications

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

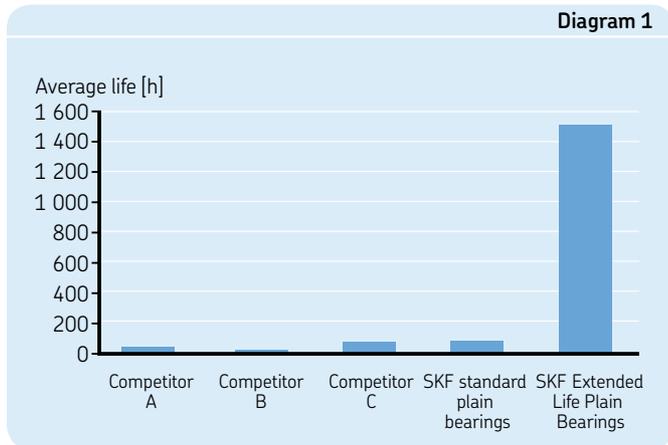
## Real-world application successes

SKF Extended Life Plain Bearings have also been field tested in various trials using off-highway vehicle such as dozers, motor graders and agricultural tractors. Application testing included positions such as steering cylinders and blade tilt pivot joints. In each case, SKF Extended Life Plain Bearings either met or exceeded the performance targets.



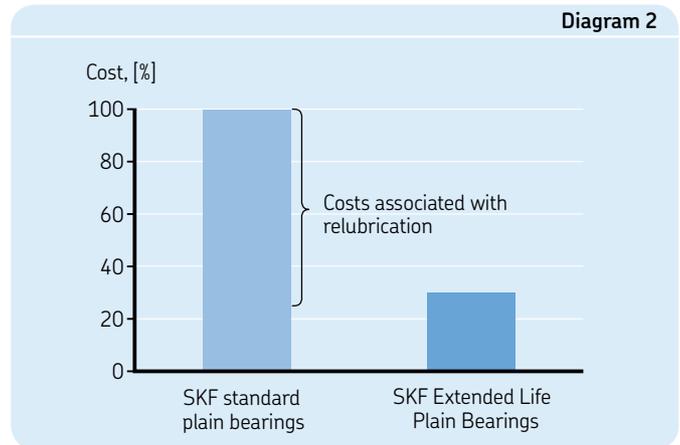
*SKF Extended Life Plain Bearings offer a drop-in, lubricated-for-life solution across a range of positions.*

# Field-tested, lab-verified performance



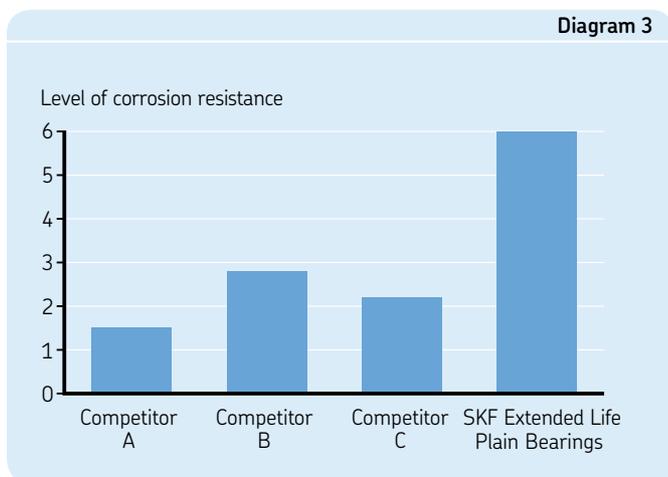
## Much longer bearing service life

SKF tested SKF Extended Life Plain Bearings against initially greased, competitor bearings as well as standard SKF plain bearings. As the results show, SKF Extended Life Plain Bearings deliver dramatically longer service life, even when carrying a 45% higher load, as they were for this test.



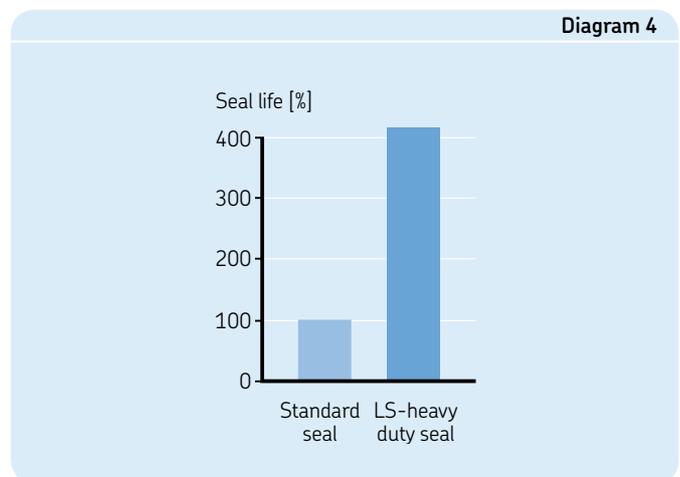
## Reduced total cost of ownership

SKF Extended Life Plain Bearings last at least as long as standard steel/steel plain bearings, even if those standard bearings are relubricated in accordance with recommended maintenance schedules. And they require less maintenance to achieve their calculated life. Lubricated-for-life, SKF Extended Life Plain Bearings eliminate relubrication-related costs, while their longer service life means less downtime and reduced lost production due to repairs.



## Unmatched corrosion resistance

To help inhibit rust, the sliding surfaces of SKF Extended Life Plain Bearings undergo a special anti-corrosion treatment. As results from the salt spray tests indicate, the corrosion of SKF Extended Life Plain Bearings is reduced to a minimum.



## 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 Extended Life Plain Bearings will last more than three times longer than standard seals.

# 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

The steel/steel spherical plain bearings with the extended life feature 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.

## 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

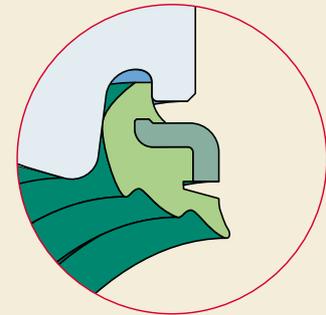
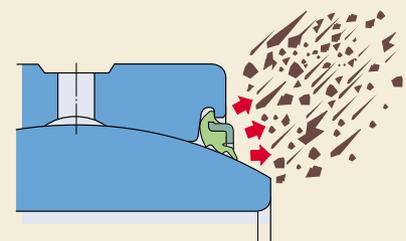


Fig. 2



# Drop-in design flexibility



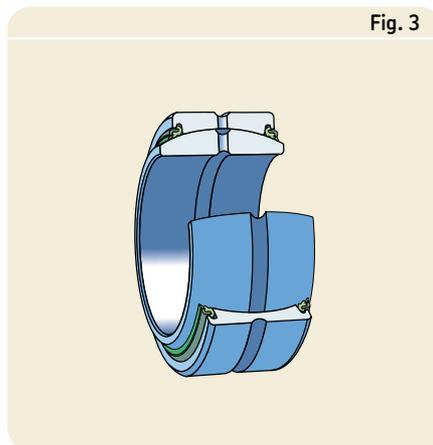
Fully interchangeable with standard steel/ steel plain bearing sizes, SKF Extended Life Plain Bearings enable trouble-free retrofits and contribute to enhanced next generation machine designs.

## 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.

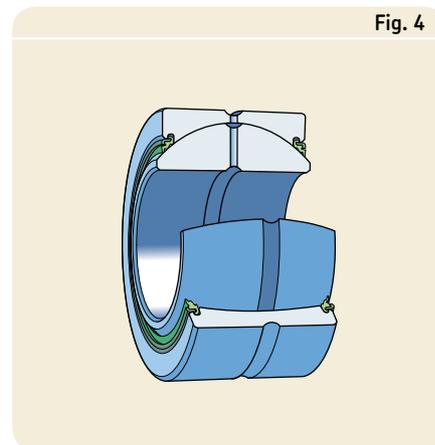
## Bearing dimensions

See fig. 3–6.



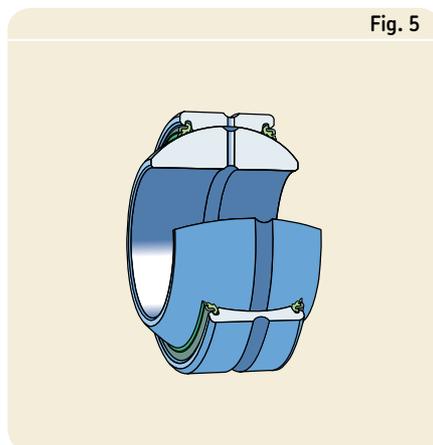
## GE .. ESX-2LS

Metric radial spherical plain bearings.  
Range: 20 to 120 mm bore.



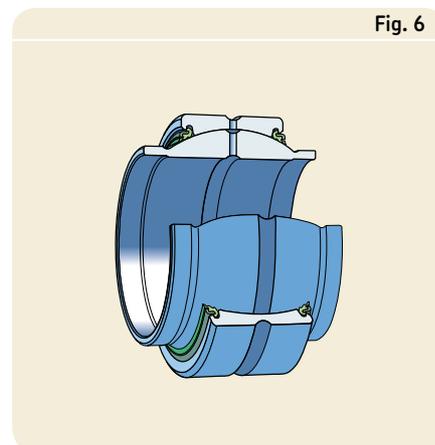
## GEZ .. ESX-2LS

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 110 mm bore.



## GEM .. ESX-2LS

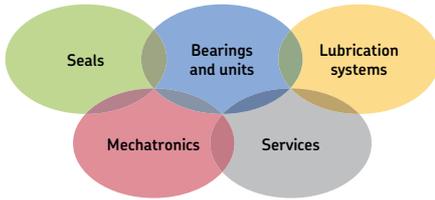
Metric radial spherical plain bearings are of a similar design to GE .. ESX-2LS, but with a cylindrical extension on both sides of the inner ring. Range: 20 to 80 mm bore.

## 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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