

Cable sheave bearings SL04 in the Liebherr crawler crane LR 11350

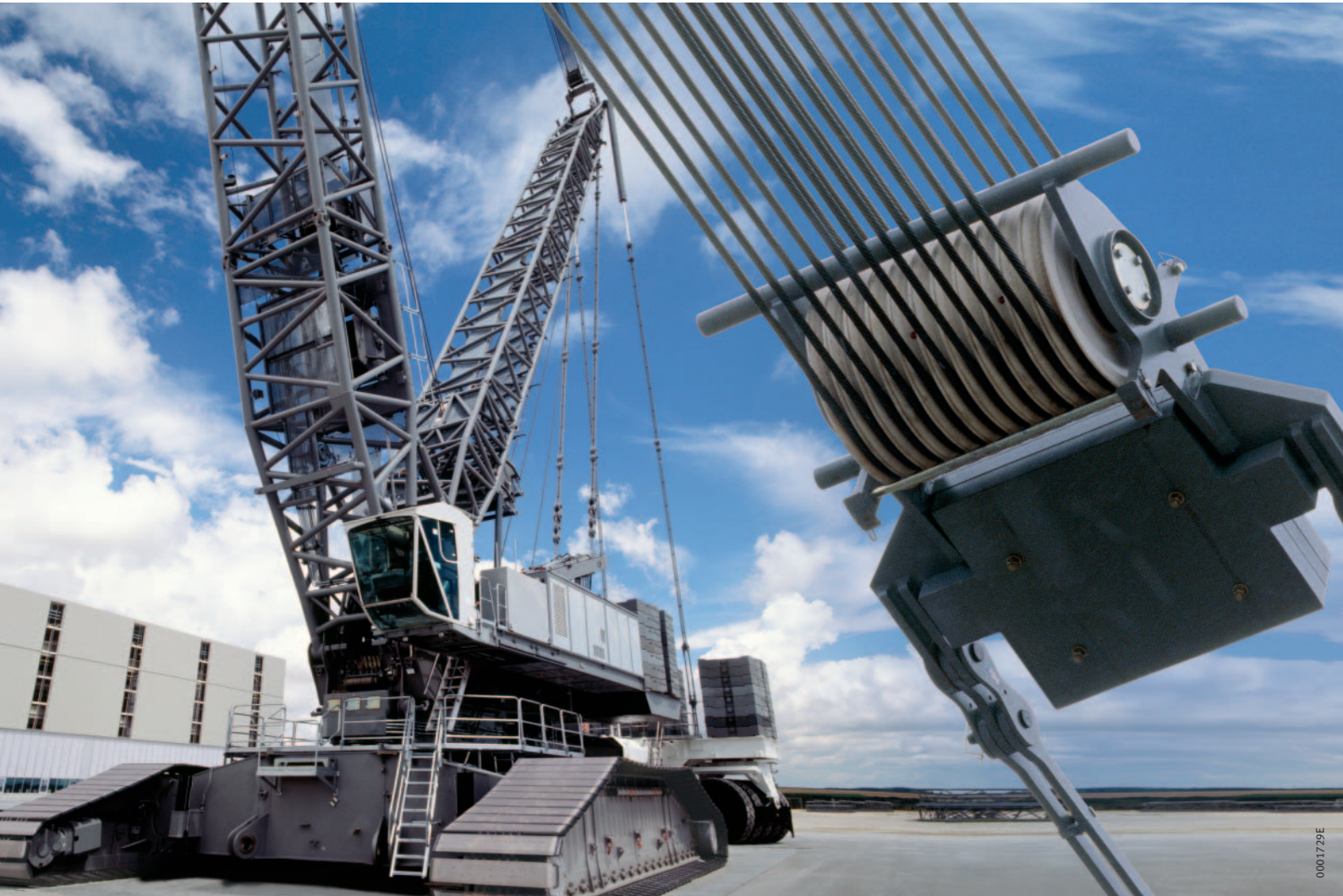


Figure 1 - Crawler crane LR 11350 from the company Liebherr

The Liebherr crawler crane LR 11350 is, fitted with a crawler track, one of the largest lattice boom cranes in the world, *Figure 1*. With a total height of the lattice boom of 228 m and a hook height of 223 m it is also one of the tallest crawler cranes in the world.

In November 2006, the crawler crane LR 11350 was used in a spectacular operation to erect two prototypes of a 5 MW offshore wind turbine on a test site in Cuxhaven.

Thanks to its modular design principle, the crawler crane can be dismantled into individual components for economical transport. The individual components are transported on separate low loaders to the installation site, where they can be reassembled quickly and easily.

The crawler crane LR 11350 can be fitted with various boom systems and a derrick system.

The cable sheave bearings SL04 fitted in the crawler crane give reliable transmission of heavy loads under all weather conditions.

For each Liebherr crawler crane, Schaeffler Group Industrial supplies more than 100 cylindrical roller bearings of series SL04 that are used to support the cable sheaves.

Technical data

- 6 cylinder turbodiesel, 641 kW
- Travel speed: 0 – 1,08 km/h
- Maximum load at maximum outreach: 1350 t at 12 m
- Maximum load moment: 22 748 tm
- Main boom: 30 m – 150 m
- Lattice point: 12 m – 114 m
- Derrick boom: 42 m
- Derrick ballast: 600 t
- Total ballast: 900 t.

Cable sheave application

Cable sheaves are used in crawler cranes and mobile cranes mainly as return and guide elements, *Figure 2*. The cable sheaves used are now made predominantly from plastic such as cast polyamide.

The decisive characteristics in this case are:

- elasticity with a favourable effect on the cable
- high wear resistance
- good toughness even at low temperatures
- good resistance to lubricants and weather conditions.

The use of plastic cable sheaves represents a further challenge for the bearings. The differences in coefficient of thermal expansion between the plastic cable sheave and the steel bearing require precise consideration and selection of the mounting fits and internal clearance.



Figure 2 · Cable sheave bearing in the example of an S boom adjustment mechanism between the boom and the derrick arm

INA cable sheave bearings

In order to obtain a cable sheave system with the lowest possible maintenance requirements, cable sheave bearing arrangements must fulfil the following requirements:

- long operating life
- effective sealing throughout the operating life
- good relubrication facility
- protection against corrosion.

In the selection of bearings, the important factors are not only good weather resistance but also low maintenance, ease of mounting and high static and dynamic load carrying capacities of the bearings.

Schaeffler Group products in the crawler crane LR 11350

Under the operating conditions in the crawler crane, where the bearings are continually subjected to high loads and temperature fluctuations, cylindrical roller bearings with Corrotect® coating offer an optimum bearing arrangement in the cable sheaves.

The cable sheave bearings SL04260-PP-RR-C5-L091 used in the crawler crane LR 11350 are fitted on both sides with robust sealing rings

and a high performance grease for high media resistance. Selection of the correct mounting fit gives a reliable bearing solution, *Figure 3*.

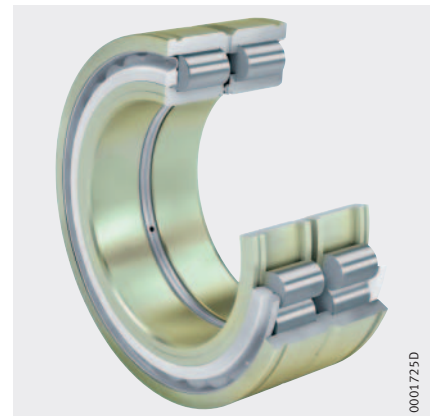


Figure 3 · Cylindrical roller bearing with anti-corrosion protection and seals

Special coating Corrotect®

Corrotect® is an extremely thin, electroplated zinc-iron coating free from Cr(VI) that is used to protect rolling bearings against corrosion and gives a significant increase in the operating life. The decisive factors are that formation of rust under the seal lip is prevented, premature wear of the seal lip is prevented and that contamination and water cannot penetrate the bearing, *Figure 4*.

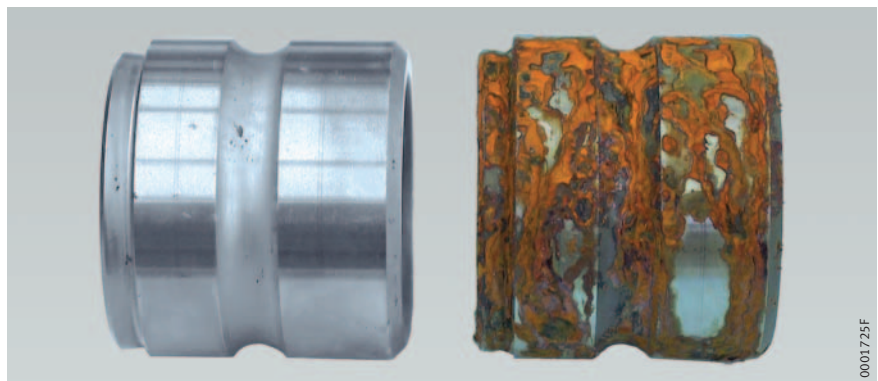


Figure 4 · With and without coating after the salt spray test

Schaeffler Technologies GmbH & Co. KG

Industriestraße 1–3
91074 Herzogenaurach (Germany)
Internet www.ina.com
E-Mail info@schaeffler.com

In Germany:
Phone 0180 5003872
Fax 0180 5003873

From other countries:
Phone +49 9132 82-0
Fax +49 9132 82-4950