SKF solution for mine hoists

SKF 1 Industrial Team

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SKF Mining, Mineral Processing and Cement
SKF solutions for mine hoists

- Bearings
- Seals
- Housings
- Sleeves
- Hydraulic assist & pumps
- Alignment tools
- Lubrication
- Automatic lubricators
- Circulating oil systems
- Fault detection
- Reliability Systems
- Total Shaft Solutions
Mining hoists

Hoist type
- Single rope
- Tower multi rope
- Floor-mounted multi rope

Bearing Operating Characteristics
- Heavy loading
- Moderate/high speed
- High acceleration/retardation forces
- Dusty environment (out door)
- Reliable operation (continuous)

Root Cause Failures
- Smearing / lubrication
- Bearings jamming in housing
- Seal failures
- Foundation out of tolerance - settlement
Bearings and Units platform

- Sleeves with oil injection
- Bearings for vibrating screens
- SensorMount
- ConCentra unit roller
- Sealed spherical roller bearing

SKF Mining, Mineral Processing & Cement
SKF Explorer performance class bearings

Offers longer service life through improved:

- Heat treatment
- Manufacturing
- Design
SKF Total Shaft Solution

- Eliminate problem of the non-locating bearing seizing in housing
- Reduce operating forces and temperatures
- Reduce vibrations

Typical Applications
- Fans
- Conveyors
- Impact crushers/hammermills
- Vibrating screens
- Gearbox (industrial & automotive)
- Grinding mills/Paper mills/ steel mills
Optimized loading with CARB and no axial friction

Floating (non-locating) bearing seizes in housings causing axial loading, friction and heat

CARB can not support axial loads.
Shaft moves inside CARB.

\[ F_a = F_r \times \mu \]

Result is high loading in bearings

Result is lower forces and temperatures

\[ F_a = 0 \]
SKF solutions for mining hoists

Down sizing example with maintained life performance

Present solution:
- (2x) 24192CC/C3
- Local made housings
- Labyrinth seal

SKF solution:
- 23192CCK/C3, C 3192K/C3 → SKF Explorer & CARB
- Taconite seal in SNL housing → Elimination of contamination
- Adapter sleeves → K7 fit on frame will eliminate housing wear

Life comparison

<table>
<thead>
<tr>
<th>Present solution</th>
<th>Same size</th>
<th>Down sizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% (non SKF Explorer)</td>
<td>280% SKF Explorer &amp; CARB</td>
<td>130% SKF Explorer &amp; CARB</td>
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</tbody>
</table>

\[ \text{kappa}=1 \quad \text{eta}=0.5 \]
SNL housings for mine hoists

Simple mounting and dismounting

- Drilled and tapped holes for grease nipples
- Identification marking on cap and base
- Notches for cap removal
- Dimple for dowel pin
- Right angle base
- Grease level marks
- Centering marks
- Seal groove relubrication bosses
- Accessories supplied
SNL housings for mine hoists

Standard seals for grease lubrication
- For metric and inch shafts
- Supplied with mounting instruction

- Dusty/fine particle contamination
- Abrasive environment
- Angular misalignment 0,3°
- Axial shaft movement up to ±4 mm

Double-lip  V-ring  Labyrinth  Taconite

Taconite for SNL 30 & 31
SAF & SDAF housings for mine hoists

- Versatile designs
- Designed for extremely demanding applications
- 222-, 223-, 232-, 230-, 231-CARB series standard
- Cylindrical mount or adapter mount
- Locating and non-locating, 2- or 4-bolt bases, variety of seals
- Designed for maximum bearing life
- 1-3/16” to 20”+ shaft diameters
- SDAF for bearing 23248 and larger
Adapter sleeves for mine hoists

Adaptor sleeves for spherical roller bearings and CARB
- Hydraulic assist std with bore \( \geq 200\text{mm} \)

Three different types depending on shaft size:
- H...E KMFE nut
- H...L KML nut
- OH...E HME nut

Customer value
- Shaft tolerance h9 instead of p6 alt. r6
- Safe and fast mounting/dismounting
Seals platform

- V-ring seals
- Contact seals
- Speedi-Sleeve
- Seal combinations (Speedi-Sleeve, contact seal, V-ring)
Lubrication systems platform

Automatic systems

LGEP2 – general machinery
LGHB2 – high temperature
LGEV2 – Large / low speed machinery

LGGB2 – Biodegradable / low toxicity
  ( for moderate operating conditions )

SYSTEM 24

Multipoint lubricator
SKF Greases

- **LGEP2 extreme pressure grease**
  - NLGI 2
  - lithium soap
  - 220 cSt @ 40 °C
Bearing remanufacturing services (bearing OD > 200 mm)

- Cleaning, inspection and analysis
- Polishing
- Raceway grinding, as needed
- Rework of cages
- New rollers, as needed
- Preservation
- Packaging
- xx month warranty
- SKF and competitor bearings

Not all services available in all locations
Housing remanufacturing (Housing bore > 430mm)

- Cleaning, inspection and analysis
- Polishing of machined surfaces
- Restore the tolerances
  - Machining of split, bore, foot
  - Metal spray or sleeve bore
- New bolts, as needed
- Painting
- Preservation
- Packaging
- Xx month warranty
- SKF and competitor housings

Before remanufacturing

After remanufacturing

Not all services available in all locations
SKF OKF oil injection coupling

- Fast and easy mounting/dismounting
- High stiffness
- Straight shaft, h6, (no key-way)
- High reliability

OKF coupling with free hanging gearbox/motor

Drive up to final position

High pressure injector bore

Low pressure injector bore
SKF XHCE oil injection flexible coupling

- Fast and easy mounting/dismounting
- Compensate for angular and offset misalignment as well as for axial movements
- Straight shaft, h7, (no key-way)
- High reliability
SKF Maintenance Products

Product Types

- Hydraulic pumps & injectors
- Hydraulic nuts
- Laser Shaft alignment
- Laser Belt alignment

Benefits

- Reduce maintenance & repair costs
- Reduce downtime
- Improve safety

Hydraulic pumps:
- 729124 (for nuts O HMVC 54E)
- 729124 DA (with digital gauge)
- TMJL 50 DA (for nuts O HMVC 200E)

Hydraulic nuts:
- HMVC .. E
- Hydraulic nut rental: ex: HMVE 48E/rental

TMEB 2 Laser Belt Alignment

TMEA 2 Laser Shaft Alignment
SKF oil injection

Hydraulic assist adapter sleeves
For 222, 230 and 231 series bearings
Starting at 200mm (4 7/16 inch) size

Hydraulic Pumps –
SKF #729124 (for nuts HMVC 54E)
SKF #TMJL 100SRB (for nuts HMVC 92E)

Digital Pump Gauge (For Oil Injection)
SKF #TMJG 100D

Hydraulic Fluid
SKF #LHMF 300 (1 & 5 Liters Available)

Dial Indicator (Inches)
SKF #TMCD ½ R

90° Angle Connector
M6 male to G½ female
SKF Part # 2084051 (Swivel Nipple)

Adapter
#1014357
For Connection To Pump

Quick connect nipple
#729832 A (d1 = 6⅛ )
To connect from SKF 1014357A to Pump

SKF Part # 2084051 (Swivel Nipple)

Hydraulic assist adapter sleeves
For 222, 230 and 231 series bearings
Starting at 200mm (4 7/16 inch) size
SKF Copperhead for mine hoists

Fault detection for bearings, gearboxes, drives

- Mechanical looseness
- Gear faults
- Bearing faults
- High temperature

Vibration and temperature monitoring
CMPT2310T
(vibration and temperature)
1 x each bearing
1 x each gearbox
1 x each motor
SKF Copperhead C series fault detection kit

Benefits
- Connectable to PLC automation systems
- Integrates vibration and temperature
- Lowest possible costs

SKF CPHD 1C kit
- (1) CMPT 2310T sensor
- (1) CMPT CTU transmitter
SKF resources

www.aptitudexchange.com

SKF Documented Solutions program (DSP)

DSP is SKF’s tool to document the value and Return on Investment (ROI) for its solution.

See www.skf.com for additional solutions
SKF solutions for mine hoists

- SKF Explorer spherical roller bearing
- CARB toroidal roller bearing
- SNL housings and seals
- Adapter Sleeves

- SKF Copperhead fault detection
- Maintenance products & Services
- SKF OKF oil injection couplings
- SKF lubrication Systems
SKF solutions for mine hoists

• Improve productivity and profitability

• Improve health and safety

• Improve the environment

For more information, contact your SKF Authorized Distributor, your SKF Representative, or e-mail us at skfcopperhead@skf.com

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