Volume 32 Number 2

Nye® Lubeletter

Synthetic Lubricant News from The SmartGrease *Company*™

New Ball Joints Rely on Silicone Grease

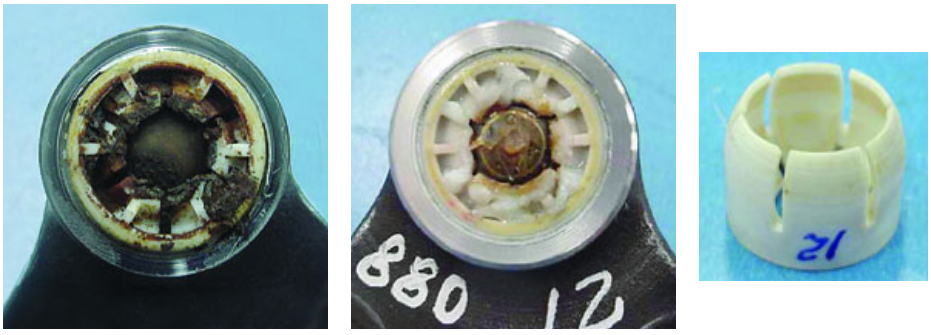
What happens to ball joints when their protective seals (a.k.a., boots or dust covers) are compromised? That depends on the bearing material, bearing package design, and the lubricant, according to "High Performance Ball Joint," a paper presented by engineers from Dana Industrial Ltda. at the November, 2003, SAE Brazil International Congress.

The paper reports, "The careful selection of the bearing material in conjunction with the choice of the lubricant can significantly improve the durability/wear life of a ball and socket joint after the protective seal has failed to protect the internal components located in the housing of the ball joint."

After selecting new materials and redesigning its ball joint, Dana conducted a study that focused on the tribology of ball and socket joints. One of Dana's goals was to develop a lubricating system that would extend the new ball joint's operating life. Previous studies at Dana-Brazil indicated the lubricant used between the ball and the bearing was a critical factor in ball joint life. This follow-up study compared three lubricants: a lithium-thickened, mineral-oil grease that is commonly used in OEM ball joint production; a PTFE-thickened synthetic hydrocarbon grease; and Nye's Fluorocarbon Gel 880, a PTFE-thickened silicone grease. The ball joints used POM bearings, known for their high resistance to friction, abrasion and fatigue.

Lubricated ball joints were aged at 70ºC for 168 hours. The protective seals were removed and water was sprayed into the ball joints. The ball joints were then subjected to controlled oscillation and rotational movements under axial and radial loads for 82,500 cycles. The final axial and radial elasticities of the ball joints were not to exceed 0.2 mm of their initial value.

The petroleum grease washed out. Bearings in ball joints lubricated with the synthetic hydrocarbon grease exceeded maximum allowable elasticity after only 25,000 cycles. Nye's Fluorocarbon Gel 880 "obtained the best performance," according to the paper. Elasticity increase was within the specification and "there was no wear of the bearing." MORE On-line



Results after 82,500 Cycles. Ball joint on the left was lubricated with fortified petroleum grease. Ball joint to the right and plastic bearing insert were lubricated with Nye's Fluorocarbon Gel 880. Ball joints are shown after 82,500 cycles under the same test conditions.
(Photos Courtesy: Dana Industrial Ltda.)

NEWSClips

STLE's Dayton Chapter invited Product and Technical Services Director Kevin Akin to be the guest speaker at its April 13 meeting. The topic is the lubrication of separable electrical connectors.

The Tri-Service Army, Navy, and Air Force Joint Oil Analysis Program in Pensacola Beach, April 18 to 22, has been added to Nye's exhibition schedule.

A paper on NyoGel® 758G, a new electrically conductive grease, was presented by Southeast Regional Engineering Manager Jay Weikel at Noria's Lubrication Excellence 2004 Conference.

Lubricants World 2003 Product of the Year was awarded to Nye for the development of UniFlor™ 8917, a new connector grease designed to reduce insertion force for separable connectors, as specified by USCAR-2, Rev. 3.

Nye's Asian Distributor Conference was held this March in Thailand.

MORE On-line

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International Corner

Amcor Australasia Using NyeCorr® 140

Amcor Australasia recently signed a preferred supplier agreement with Hi-Tec Oil Traders Pty Limited, Nye's agent in Australia, for supply of high-temperature lubricants. Under this agreement Hi-Tec Oils supplies NyeCorr 140 for use in Amcor's "heated roll bearings" on a singleface, the machine at the heart of the paperboard manufacturing line that forms the flutes on corrugated paper.

NyeCorr 140 is designed specifically for heated roll bearings, which operate in wet, high-temp environments. NyeCorr 140 is a perfluoropolyether (PFPE) grease, thickened with polytetrafluoroethylene (PTFE), and fortified with antioxidants. Completely fluorinated, the grease delivers excellent thermooxidative stability, an essential characteristic for extending lubrication intervals. In corrugating, this minimizes unscheduled downtime by ensuring that the bearings last the life of the rolls. NyeCorr 140 is nonflammable, non-toxic, chemically inert, ozone-safe, and withstands temps to 260°C.

Amcor is a leading global packaging company with annual sales of approximately A$11 billion. Based in Australia, Amcor has operations throughout Australasia, Asia, Europe and the Americas. In Australia, the group operates 70 manufacturing plants and enjoys significant market share.

Ford Approves Connector Grease

The Ford Motor Company approved the use of Uniflor™ 8917 (Ford Tox Number: 70756) in all North American plants.

UniFlor 8917 is a novel, high-temperature, perfluoropolyether (PFPE) grease designed to meet the insertion force and resistance requirements of SAE/USCAR-2, Revision 3: The Performance Standard for Automotive Electrical Connection Systems.

In related news, UniFlor™ 8917 was named Product of the Year in *Lubricants World* magazine's 2004 Annual Awards. Senior Editor Rob Harvan wrote in the January issue, "UniFlor 8917 exemplifies the best characteristics of a high-quality lubricant: performance that exceeds specifications, outstanding user-friendliness, and cost-effectiveness." MORE *On-line*

If you want to quickly identify the characteristics of a grease, get the right generic name.

The type of oil in a grease determines the temperature limits, material compatibility, affinity to metals, oxidative stability, load-carrying capability — and a host of other characteristics that are important to the design engineer.

"Lithium grease" and "moly grease" — two phrases you may hear frequently — don't tell you much. "Lithium" is a type of soap used to make grease. "Moly" is short for molybdenum disulfide, an additive that increases a grease's load-carrying ability (and makes it black). Though not very precise, terms like "petroleum grease" and "synthetic grease" are more informative because they at least refer to the two major classes of lubricating oils. However, depending on how the petroleum is refined or the type of synthetic oil, grease characteristics will change dramatically.

If you really want to know something about a grease, ask for oil-based names — like synthetic hydrocarbon, polyglycol, PFPE, ester, or silicone. And don't take "lithium" for an answer.

Nye's MIL-PRF-32014 Grease: "A-OK"

Last year, we reported that Rheolube™ 374A, a synthetic grease that Nye developed in cooperation with Wright-Patterson AFB to meet the requirements of MIL-PRF 32014, would undergo long-term flight tests on the landing gear of the C-5 heavy-cargo, intercontinental aircraft. After nearly 1,529 airframe hours or roughly 11 months of operation, 351 total landings, 299 full-stop landings, and 360 gear cycles, equipment specialists from Dover Air Force Base, DE, have recommended the Air Force convert to the new moisture-resistant and high-load carrying grease.

"The C-5 landing gear is regularly exposed to moisture and rain, air, bacterial decontaminants, and other corrosion and wear encouraging phenomena, which at times causes significant problems for operators, and challenges for systems maintainers," said Lois Gschwender, an engineer from the nonstructural materials branch in Air Force Research Lab's materials and manufacturing directorate. "During flight testing, the new grease has proven that it provides superior anti-wear and anti-rust performance and will provide a significant cost advantage (because of) reduced maintenance, part replacement and system failures." [AFMC News Service Release, February 4, 2004]

Rheolube 374A is a lithium-soap-thickened, medium viscosity synthetic hydrocarbon grease designed for high-speed and high-temperature applications. Suitable for –40°C to 150°C, it shows excellent resistance to water washout, evaporation, and corrosion. MORE *On-line*

Nye® *Synthetic Lubricants* *The* SmartGrease *Company*™

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