

Product Service Bulletin

Vol. 10, September 2003



Ask the experts

Q: What is false Brinelling?

A: First, we must examine *true* Brinelling.

Brinelling refers to the process of denting a material. This is done when a force is applied that exceeds the yield strength of the materials surface. If the material is malleable, like steel, a dent is formed.

A property of any malleable material is its Brinell hardness which is determined by the force per unit area required to make a standard dent.

False Brinelling is so named because it looks like a dent, but is not. It is actually scratches in the surface of the material caused by a hard object rubbing the surface.

In a bearing, this can be

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Failure Analysis Program

By Jim Bryan

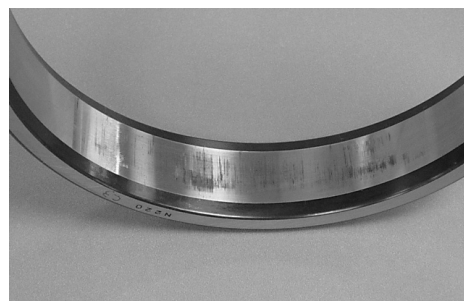
Last year, we conducted a very successful program to return NEMA frame winding failures to the plant of manufacture for post mortem evaluation and root cause analysis. With your support, we were able to glean valuable data that we reported in our first edition of the Product Service Bulletin last October.

We are still implementing process and design improvements from the findings of that exercise. The result is a better, more trouble free product for our mutual customer.

Continuing in that success, we are announcing a new program with similar goals. The second biggest hitter on the typical motor failure Pareto Chart is bearing noise/failure. Just as with winding failure, we can only speculate what the cause is based on the limited data we have.

Our intent is to develop data that will help us find the root cause of these failures and eliminate them.

Any such study must be conducted completely without



False Brinelling on the Outer Face of a Roller Bearing

preconceived ideas. One must follow the evidence discovered and not form the evidence to fit the desired outcome. Having said that, our preliminary investigation has shown that significant bearing damage can occur during the shipping of the motor.

The picture above is of a bearing removed from a motor that had been shipped from Memphis to California to Pennsylvania and back to Memphis. This was a controlled experiment where new bearings had

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been installed in the motor before it left Memphis. The motor was never removed from the shipping pallet.

The extent of the false Brinelling on this bearing would almost certainly result in noisy operation and premature failure. The question this begs is, how many bearings in how many motors have been thus affected?

Other areas of concern relative to bearing life are lubrication, alignment, application, load and contamination. We have addressed many of these in previous articles. This study will help us quantify the impact of these issues, determine others that might exist and develop design/process improvements to deliver better product and service to the

customer.

Beginning in October, we ask that you send all bearings from US Motors branded product, both NEMA and Titan repaired under warranty to the address below. The bearings should be marked with position (either DE or ODE) and orientation (Which side of the bearing was against the shaft shoulder?). We will continue this program through December with a possibility of extension through March.

A copy of the completed warranty report should be included with the returned bearings. The warranty report may include the cost of

ground shipping plus a \$10 handling fee. These should be line items on the warranty report in addition to the other warranty repairs required. They should also be included in the invoice that is to be sent through normal channels to be processed.

Do not include the invoice with the bearing shipment, as this will delay your payment.

Ship bearings to:

**Emerson Motor Technologies
Product Service Dept.
Attn: Bearing Return Program
8100 W. Florissant Ave.
St. Louis MO 63136**

Emerson Motor Technologies Product Service Department



Front Row (L to R): Cheri Newman, Carol Powitzky, Fred Spaid
Back Row (L to R): Ben Biondi, Dwayne Roberts, Bob Wiesler, Jim Bryan

Ask the experts

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the result of vibration that occurs when the bearing is not turning. Machine tool marks made when the part was machined will be smoothed or eliminated in false Brinelling but not in true Brinelling.

Have a question for the experts? Contact us at emersonmotorhelp@usmotors.com