

Grease Weepage Visual Guidelines

TIMKEN
Where You Turn

Introduction

These guidelines are to provide an explanation and better understanding of grease loss. This is NOT intended to be used as a substitute for, or to circumvent, the Association of American Railroads (AAR) or Federal Railroad Administration (FRA) rules regarding journal roller bearing seals and grease leakage.

The AAR rules, based on extensive experience, allow grease loss as long as the seal is not damaged, cocked or loose in the cup connective. However, the decision of whether to remove a bearing from service is complicated further by FRA Rule 215.115(a)(3), which states that a roller bearing may not continue in service if the seal "permits leakage of lubricant in clearly formed droplets."

Grease Weepage

Grease weepage from seals is normal. A small amount of grease weepage may give the appearance of a problem, but it is actually normal in the absence of any visual damage. The amount of weepage depends on several factors:

- 1. Temperature.** Grease softens with increasing temperature and the softer or more fluid the grease, the greater the tendency toward weepage. Bearing operating temperature is influenced by ambient temperature, air flow, load, speed and length of operation. Truck and car design also play a major role in providing adequate air flow to the bearings. All of these variables affect the consistency of the grease.
- 2. Bearing internal pressure.** The higher the bearing operating temperature, the greater the internal pressure due to air expansion. Non-vented bearing assemblies or assemblies with clogged vent passages have the potential for greater internal pressure, which may lead to grease weepage.
- 3. Dynamic operating conditions.** The dynamic wheel/rail interaction transmits vibration and shock loads to the bearing that can be great enough to cause the seal lip to momentarily separate from the seal wear ring. This separation provides opportunity for a small amount of grease to pass under the seal fluid lip, especially if the bearing is operating under internal, thermally induced pressure. The bearing vents through the seal lips, and, through venting, it causes a small amount of grease weepage.

Visual Aids

In previous years, the FRA conducted investigations of grease loss from roller bearings on double-stack container cars. Figures 1 to 4 show four examples of fresh grease weepage where the FRA inspectors noted the weepage and allowed the bearings to continue in service.

Figures 5 and 6 show examples of old grease accumulations (grease covered with road dirt) once weepage has slowed and/or subsided.



Fig. 1.



Fig. 2.

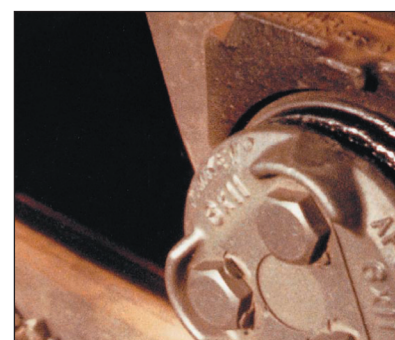


Fig. 3.

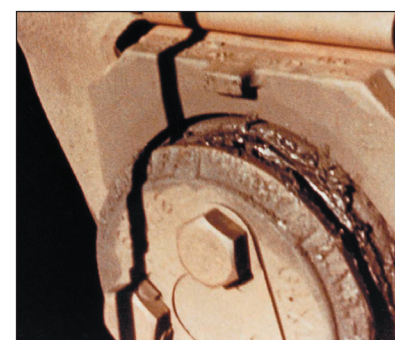


Fig. 4.



Fig. 5.



Fig. 6.

Figs. 1 to 4. Examples of fresh grease weepage where bearings were allowed to continue in service (note shiny/wet appearance of grease).

Fig. 5 (car) and Fig. 6 (locomotive) Examples of old grease accumulations (dried and covered with road dirt).

Inspection Procedure

Visually inspect the seal for any indication of physical damage from impact or contact, and look for a cocked, out-of-position seal. Check the seal for looseness by attempting to rotate by hand or with a suitable probe. Any damage or looseness is cause for bearing removal.

If it is not necessary to wipe off the grease weepage to adequately inspect the seal, follow the guidelines below:

1. DO NOT use solvents or a probe to remove weepage. Doing so could damage the seal elastomer.
2. DO NOT wipe in the area near the elastomer seal lips.

Conclusion

Experience shows that Timken® AP™ bearing seals will retain an adequate amount of grease for safe bearing operation through a service period. The appearance of grease weepage is not in itself an indication of a problem if inspection shows the seal is not damaged, loose or cocked out of position.

For additional information, contact your Timken sales representative at 1-800-964-2626 or 1-800-368-4401. Or reach them via fax at 330-471-7032, or visit www.timken.com/rail.

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WARNING Failure to observe the following warnings could create a risk of serious injury.

Proper bearing maintenance and handling practices are critical. Failure to follow installation instructions and to maintain proper lubrication can result in equipment failure, creating a risk of serious bodily harm.

When grease loss is noted, the seal should be inspected according to AAR Field Manual Rule 36.A.11a & b. Damaged, cocked or loose seals are an indication that a bearing should be removed from service.

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