



## Issue 13: Bud's Take on Re-Visit of Excessive Grease

It is common knowledge industry wide that more than 50% of bearing failures are due to lubrication issues. Difficulty often results when the term inadequate lubrication is used. This leaves the door open for vast interpretation. What does it mean? Is there too much, too little, wrong viscosity, contamination, etc. The reality is that more information is necessary to find the root cause.

Since I first wrote this in 2013 I continue to see failures that occurred due to lubrication issues. So I felt it was a good time to re-visit excessive or over-greasing and how this can lead to premature bearing failure.

### Important Bearing Terms:

**Bearing Free Space** is the area remaining inside of the bearing cavity after subtracting the space consumed by the rolling elements and retainer.

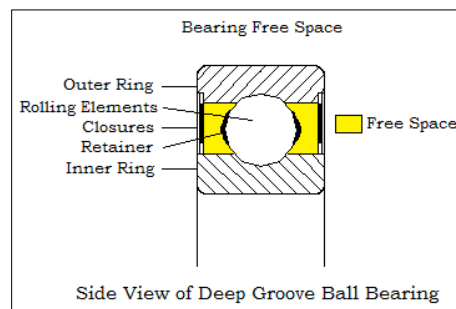


Figure 1: Representation of Bearing Free Space

**Closures** are seals or shields added to the bearing to maintain grease and protect against contamination.

### Bearings with Closures (Seals or Shields)

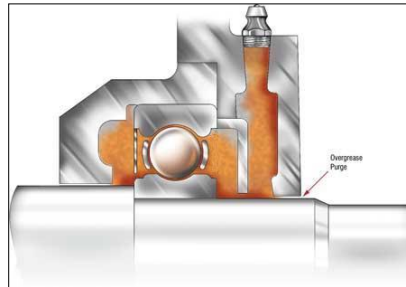
Bearings with closures on both sides are supplied by bearing manufacturers with approximately 20-50% grease fill. This amount varies by manufacturer and application. These type bearings are considered maintenance free, sealed or shielded for the life of the bearing (or grease.) No grease replenishment is required. One reason closures are employed is due to the grease life exceeding the calculated bearing life. If no grease is added, over-greasing will not occur. Picture 2 shows a collapsed shield that we believe was caused by extreme external pressure from a pneumatic or high pressure grease gun.



Pic 2: Collapsed shield, possible cause pressure from grease gun.

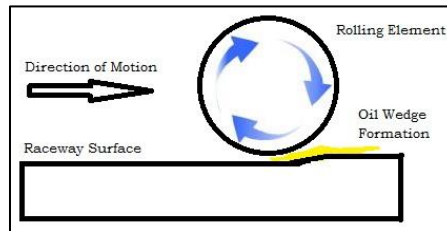
## Excessive Grease Issue

To focus on excessive or over-greasing we will assume the feeding interval, compatibility, and all other issues are correct. In an application where grease is to be added it is critical that a path is available for excessive grease to leave the chamber. This can be covered with pressure relief valves, drain ports, gaps for allowing purging, see figure 3. If a path is not present, the rolling element will have to work hard to rotate properly resulting in heat buildup.



**Figure 3: Grease purge.**

This heat buildup will cause the reduction in bearing clearance, shortening of grease life and lead to premature bearing failure. To simplify the concept of excessive lubrication I use the example of running on a beach. Running in one inch of water requires little work to maintain speed. If the water level is increased to waist high in depth the amount of work required to maintain speed dramatically increases. Figure 4 represents the thin oil film required for proper rotation.



**Fig 4: Rolling element rolling over oil**

## Conclusion

Excessive lubrication will cause heat generation and reduce bearing life. Although ISO281 offers guidance there are far too many variables to determine an exact percentage of life lost. To maximize bearing life review that your lubrication practices are correct. Always employ the proper type grease/oil relief valves.