



## The Importance of Wheel Bearing Maintenance

truck running on sealed roads, the bearings need to be inspected at no more than every 150,000 km or at least annually. When well maintained, wheel bearings should last through several such C-level checks. Dirty workshop conditions can cause contaminated lubrication and bearings should be washed with solvent before being repacked. Ensure that the parts are washed and blown down before reassembly as solvent will destroy grease. Use a quality grease that the axle manufacturer accepts. Make sure there is no dirt in the hub cap as this will get into the bearings and use new and correct hub seals. Note that axles that have been run under water will probably need cleaning and repacking.

If inspection shows that one bearing needs to be replaced, replace both.

2. Overloading, leading to excessive forces on the bearing. Weight overload pushes the grease off the rollers in the bearings and they start to run hot. This is not a common issue as modern bearings have impressive load ratings.

3. A faulty bearing, leading to mechanical failure. Mechanical defects that allow a roller to come out of the bearing cage will result

in complete bearing failure. This is a rare occurrence but there are good bearings and not-so-good bearings in the market.

4. Excessive end play in bearing adjustment. Slack in the assembled hub will result in side-side movement between the cup and cone of the wheel bearings. Further, the seals may leak. This can eventually lead to cage failure and bearing collapse. There should be no movement when the lifted wheels are shaken in and out. The hub should turn a few times when it is manually spun.

5. Excessive pre-load due to the axle nut being too tight.



Wheel vibrations have produced characteristic wear marks on this mid-life bearing cup.



Complete failure of inner and outer hub bearings.

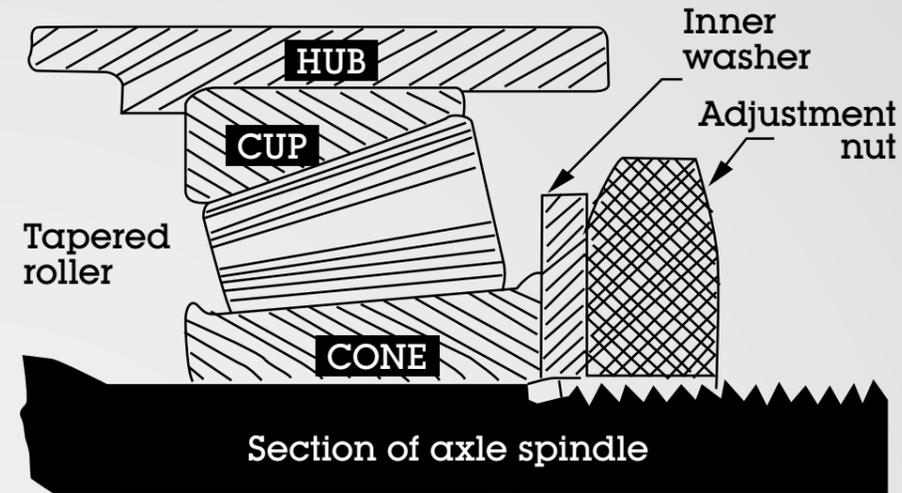
I have recently investigated two trailer fires that started due to failed wheel bearings. This has highlighted to me the importance of diligent maintenance and scheduled replacement of wheel bearings. Whilst truck bearings can also fail, it is more common for bearing problems to occur on trailers.

Both fires were caused by complete failure of an outer wheel bearing. This resulted in the axle drooping and the brakes dragging. The brake drum overheated and the tyres experienced an extremely high temperature. Eventually one of the tyres caught fire and the fire then spread via tyres to the trailer body above. The early warning signs of wheel bearing problems are:

- Abnormal or uneven tyre wear on one wheel.
- Hub cap is too hot to touch.
- Wheel vibration, wobble or noise.
- Decreased braking power.
- Pulling to the side during moderate or heavy braking
- Wheel lock-up or skidding

There are five potential causes of bearing failure; which are:

1. Inadequate or poor-quality lubrication. Most commonly this is due to excessive service intervals. Keeping track of the service level of a 'quick-hitch' trailer is challenging and a strict policy is needed to ensure every trailer is maintained inside reasonable time and / or kilometre limits. For a highway



Identification of bearing parts. The rollers are kept in contact with the cone by a cage, which is not shown.

Taper roller bearings are designed to have a light preload and should not experience looseness. Seals also appreciate a light preload. However, excessive pre-load will

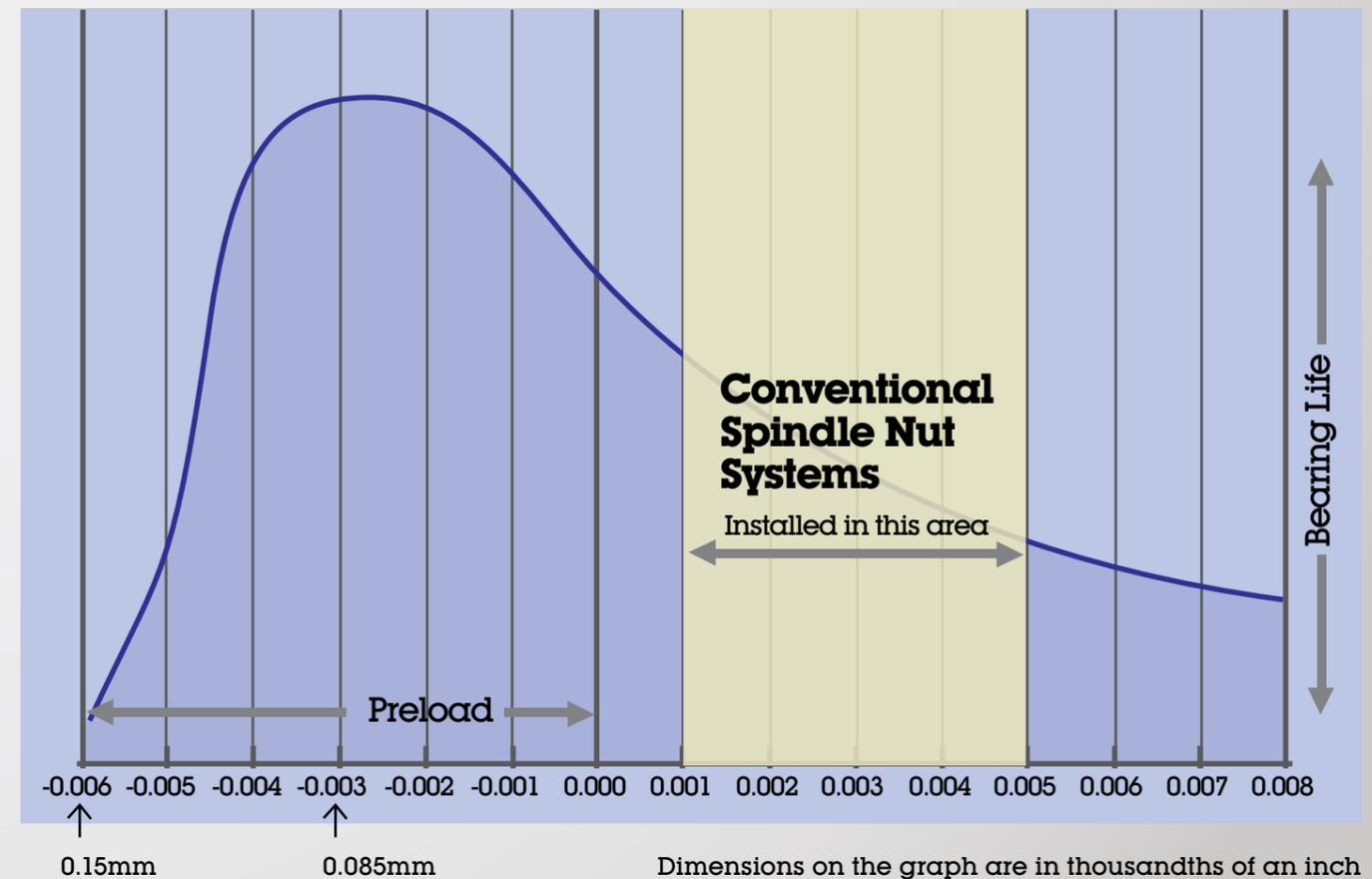
disrupt bearing lubrication and cause them to run hot. Premature failure is possible. The following diagram, which is based upon Hendrickson information, shows

that the difference between acceptable and unacceptable preload might be as small as 0.004" = 0.1 mm. This is challenging for the mechanic to set accurately.

There are tools and indicators that can help. Preload adjustment tools are available, mainly in the USA. Indicators exist that pick-up abnormal vibrations when a wheel is in transit. Indicator strips that change colour when they experience temperature above the rated level can be stuck onto the hub. This can highlight excessive hub temperature, which indicates bearing distress. Drivers might also sense higher than expected hub temperature by hand.

The other danger is that a wheel might come off and hit someone when bearings fail. A disciplined approach to bearing maintenance will control the severe risks associated with bearing failure. It's a no-brainer!

Dr Peter Hart, Chairman



Wheel bearings are designed to have a light preload.