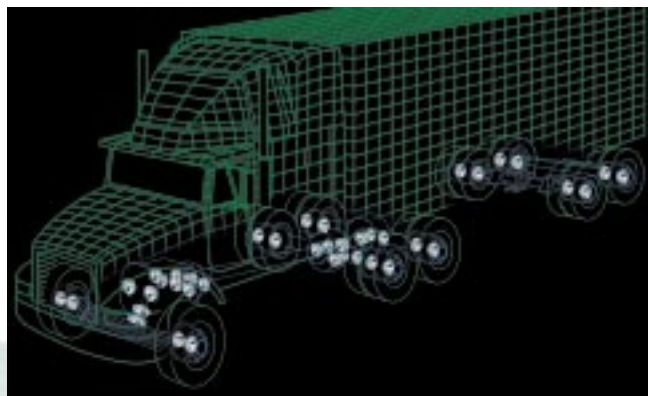








BEARING DAMAGE CHECKLIST:

Early signs and symptoms of differential and transmission





Differential and transmission repairs on a heavy-duty vehicle can be expensive and may result in significant downtime. However, problems with these driveline gearboxes can be detected at an early stage. The following conditions during normal operation of the vehicle may be early signs of a driveline problem:



Operating Conditions:

-  Noise
(may indicate damage to a driveline component)
-  Vibration
(may indicate surface wear/roughness of a driveline component; may be felt on the gearshift lever)
-  Shaking
(may indicate a loosened component; may also be felt on the gearshift lever)
-  Difficulty shifting gears
(may indicate a transmission component problem)
-  Higher-than-normal operating temperature
(high temperatures during other than heavy-pulling conditions may indicate low lubricant level or worn-out lubricant)
-  Low lubricant level
(may indicate lubricant leak, underfill, or overuse)
Lubricant leak on outside of gearbox
(may indicate a seal problem)

Lubricant Conditions:

-  Color
(gray, "milky" appearance could indicate presence of water)
-  Consistency
(thick oil may indicate lubricant breakdown)
-  Presence of metallic debris/contaminants
(may indicate excessive wear or spalling of gear teeth or bearing surfaces)
-  Burnt/discolored area on outside of differential or transmission housing
(indicates extremely high temperature or low lubricant level)

Risks of higher maintenance and repair costs increase if these warning signs are ignored and if further inspection and/or maintenance is not performed.

Drivers and service technicians who develop a keen eye for detecting these signs and symptoms of

Stay tuned to Tech Tips...in our next issue, we will review signs and symptoms of bearing and other component-related damage that may be observed during differential and transmission teardown and

**Thanks to Howard Adkins of Young Truck Sales in Canton, Ohio, for his contributions to this and the next issue.*

Introducing Tech Tips! The Timken Company's quarterly bulletin promoting safe, proper bearing handling practices for the heavy-duty market. About every three months, a new issue of Tech Tips will appear in Fleet Owner. We invite you to tear them out and post them on the bulletin board, or route them around the office and the shop.

You may have noticed that this issue is called Volume 4, Issue 1.



That's because Tech Tips has been around for a while. We just recently have expanded the distribution via Fleet Owner magazine and invite you to order back issues if this is your

first exposure to Tech Tips.

To receive a complete set of Tech Tips, Volumes I - 3, fill out the information below and fax the form to us at (330) 471-7032. Please allow four weeks for delivery. For more information on Timken products and services, contact your nearest authorized distributor, visit our Website at www.timken.com or call 1-877-TIMKEN-1.

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WARNING!

Proper 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. Never spin a bearing with compressed air. The rollers may be forcefully expelled creating a risk of serious bodily harm.

SAFETY CHECK

According to the National Transportation Safety Board, the incidence of wheel separations is about 750 to 1,050 per year. The Safety Board identified improper truck-wheel maintenance as a potential cause. Most often cited were inadequate in-service inspection guidelines and failure to adhere to recommended maintenance practices. At The Timken Company, we care about your safety and the safety of everyone on the road. Please follow recommended wheel-end inspection and

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