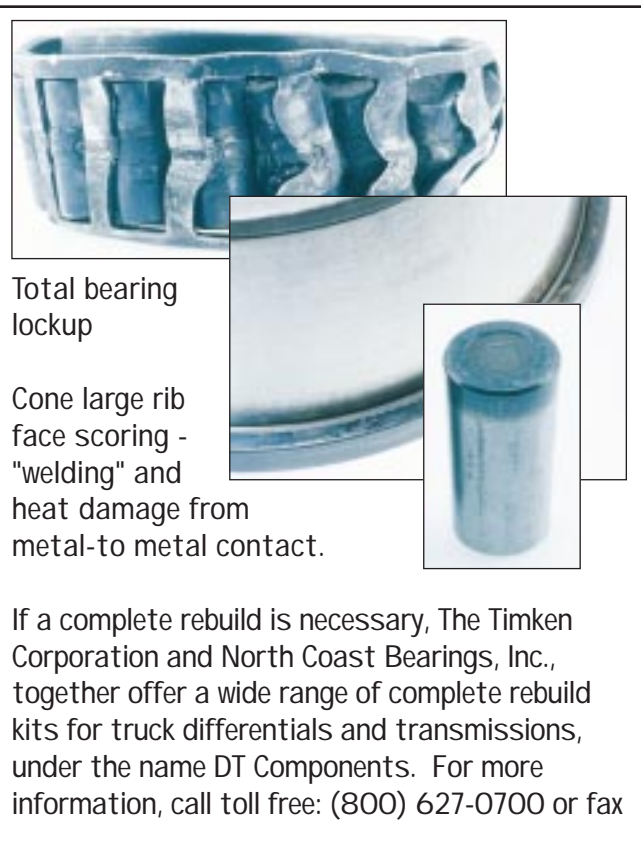


## BEARING DAMAGE CHECKLIST:

### Signs of advanced problems in differentials and transmissions

Our last issue discussed early signs and symptoms of differential and transmission problems that may be noticed during normal operation. Below is a list of problems that may be observed during troubleshooting, inspection, teardown or rebuild of these driveline gearboxes.

- Sludged, discolored or caked lubricant
- Metallic wear particles or metal flakes/chips in lubricant or at bottom of housing
- Discolored or burnt components
- Rusty components
- Loose or damaged locking nuts
- Gear tooth spalling
- Gear tooth wear
- Gear tooth heat scoring
- Damaged synchronizers
- Worn or damaged gaskets or O-rings
- Worn or damaged seals
- Shaft damage or wear at bearing cone seat
- Housing damage or wear at bearing cup seat
- Bearing damage, including:
  - Spalling on raceways or rollers*
  - Wear on raceways, rollers or cone large rib face*
  - Cone bore wear or back face wear*
  - Wear on outside diameter or back face of cup*
  - Any sign of heat or scoring*



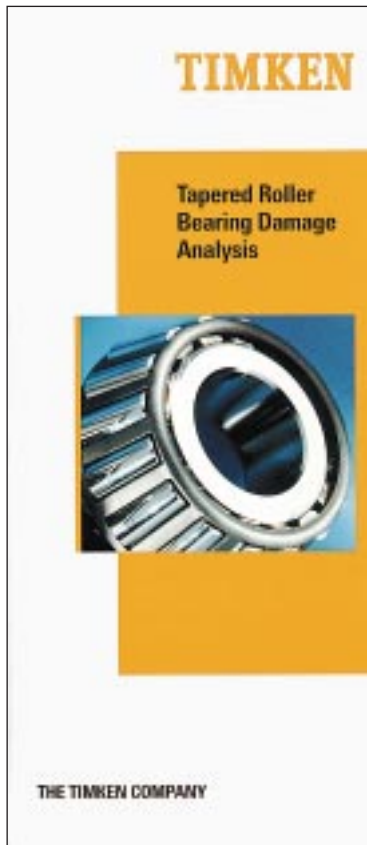
Total bearing lockup

Cone large rib face scoring - "welding" and heat damage from metal-to-metal contact.

If a complete rebuild is necessary, The Timken Corporation and North Coast Bearings, Inc., together offer a wide range of complete rebuild kits for truck differentials and transmissions, under the name DT Components. For more information, call toll free: (800) 627-0700 or fax

*Damaged or bent cone cage*

These problems -- which may have been avoided had earlier symptoms been detected -- indicate the need for further investigation and potential repair to driveline gearboxes. In some cases, a complete rebuild of the gearbox may be needed. Drivers and service technicians who develop good preventive



With The Timken Company's detailed Bearing Damage Analysis Brochure, you won't have to guess at the cause of bearing damage. To receive a copy, fax your request using the order form below to (330) 471-7032. For more information on Timken products and services, contact your nearest authorized distributor, visit our Website at [www.timken.com](http://www.timken.com) or call 1-877-TIMKEN-1.

**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

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

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