Automotive TechTips

TIMKEN
Where You Turn

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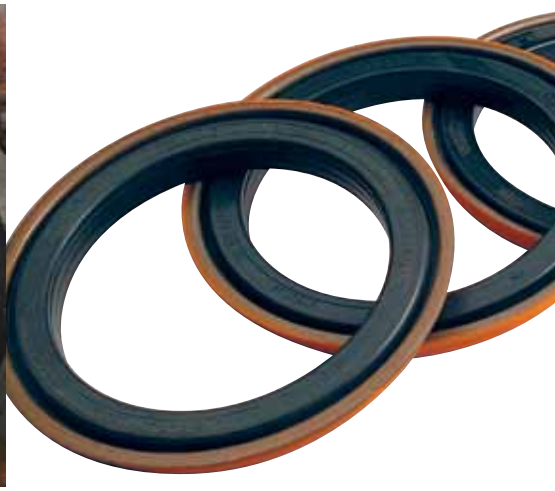
Maximizing bearing performance and life remains an objective throughout The Timken Company, from design teams and manufacturing associates to our field sales team and distributors. *TechTips* helps you install and maintain Timken® bearings, seals and components to take full advantage of their performance and the systems in which they operate. For more information regarding Timken automotive products and services, visit www.timken.com or contact your local Timken distributor.

SEAL TROUBLESHOOTING



It can be challenging to properly troubleshoot potential seal problems. When attempting to diagnose a seal-related issue, ask these questions and then review the troubleshooting guide. The questions and guide will assist you with the evaluation and repair of seals.

Questions to Ask

- How long has the problem occurred?
- Is the seal leaking from the outer or inner diameter?
- What is the surface finish of the shaft?
- Has the manufacturing process of the shaft changed?
- Has the shaft been reworked or machined?
- When and/or in what conditions does the problem occur?
- In what automotive application is the seal used?
- In what environment is the seal used?
- What was used to install the seal?
- How fast does the shaft turn?
- To what temperature was the seal exposed?
- What type of lubricant is being used and has it changed?

TROUBLESHOOTING GUIDE

Symptom	Example	Course of Action
Hardened sealing lip surface		• Check the operating temperature. Excessive temperatures can cause the seal lip to harden. • Check for inadequate lubrication or incompatibility with the sealed fluid.
Brittle or cracked sealing lip		• Check the operating temperature of the lubricant. • Make sure the seal is properly sized. An overly tight fit on the shaft will cause overheating. • Check the adequacy of the lubricant for the type of seal used.
Sealing lip shows excessive wear		• Make sure the shaft finish is not too rough at the point of lip contact. • Make sure the seal was properly prelubricated before installation. Check the adequacy of the lubrication for the type of seal used. • Make sure the seal is the proper fit. An overly tight fit can cause overheating and rapid wear. • Make sure that shaft runout and misalignment do not exceed recommended limits. • Make sure the seal sits close to the bearings. Check for excessive looseness in the bearing or splines.
Sealing lip worn on one side (directional helix marks worn off)		• Make sure there is no misalignment of the shaft to the bore. This can generate rapid wear at a single point on the sealing lip.
Torn seal lip		• Damage may have been caused by improper assembly of related parts or the use of improper installation tools. • Confirm that the seal was guarded by a seal protector when installed over splines, keyways or snap ring grooves. • Make sure that proper installation tools and methods were used. • Damage can result from debris contacting the seal lip during operating conditions, which may be too severe for the type of seal being used.
Nicked or scratched sealing lip		• Damage may have been caused by careless storage and handling or use of improper assembly tools. • Make sure the shaft was properly cleaned before installation. • Make sure that proper installation tools and methods were used. • Confirm that the seal was guarded by a seal protector when installed over splines, keyways or snap ring grooves.
"Blown-out" sealing lip (or reversed direction of lip contact)		• Look for excessive pressure buildup or plugged vents. Vents may become clogged if they are not covered during painting. • Check the lubricant level. Heating of the lubricant causes expansion and the pressure can blow out the seal.
Softened sealing lip surface		• Check compatibility of the fluid and the sealing element. Cross contamination of incompatible fluids can cause a rubber seal to swell and disintegrate.

⚠ WARNING ***Failure to observe the following warning could create a risk of serious injury.***

Proper maintenance and handling procedures are critical. Always follow installation instructions and maintain proper lubrication.

TechTips is not intended to substitute for the specific recommendations of your equipment suppliers.

Every reasonable effort has been made to ensure the accuracy of the information contained in this writing, but no liability is accepted for errors, omissions or for any other reason.

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