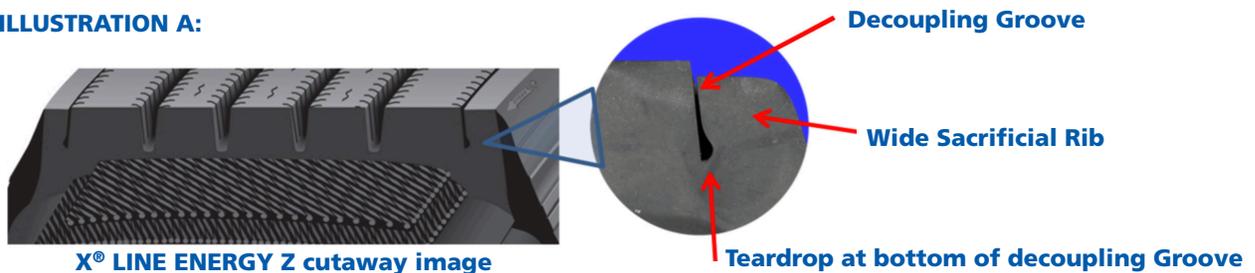


Sacrificial Rib / Decoupling Groove Damages

Several Michelin products for all position and trailer "Line Haul" applications are designed to include the "Decoupling Groove Feature". Decoupling grooves, also known as defense grooves, are features that help resist the onset of irregular wear. These features are primarily found on Line Haul all-position and trailer position tires. The defense groove separates the sacrificial rib from the outer tread ribs, thus preventing the onset of shoulder wear from spreading to the tread ribs. The technology contributes to long, even wearing tread life, especially in slow wear rate applications.

The MICHELIN® X® Line Energy Z patented sacrificial rib design provides irregular wear protection to the shoulder ribs. It is also engineered to be more robust in preventing tearing at the groove bottom. As shown in Illustration A, the width of the sacrificial rib grows wider towards the bottom, providing support to the tread rib under load, and helping to prevent the onset of irregular wear. The teardrop at the bottom of the decoupling groove helps prevent tearing in the groove from potential over flexing.

ILLUSTRATION A:

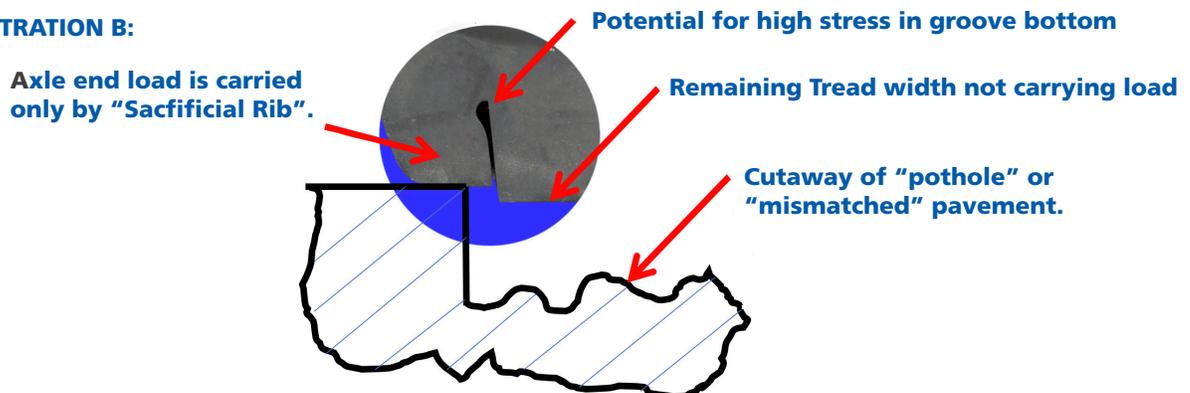


Damage probable cause(s):

While the Sacrificial Rib / Decoupling Groove feature serves an important purpose in extending tire tread life, it can be susceptible to potential damages. One area of concern is zero-speed turning (i.e. turning the vehicle's steering wheel when the vehicle is not in motion), as it can cause tearing of the sacrificial rib or splitting in the decoupling groove. Over flexing of the sacrificial rib may also cause damage during operation in more regional, high scrub applications. Damages can be caused by hazards such as mismatched drop off pavement, potholes, and curbs (see Illustration B). Operating at excessive temperature may also contribute to the damage.

Sacrificial rib tearing may be accompanied by micro sipe tearing or upper sidewall scrub as indicators of the root cause.

ILLUSTRATION B:



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Recommended action:

Sacrificial rib / decoupling groove damages can be classified in three levels of severity:

CLASS "A" Injuries to sacrificial rib or micro-siping with no decoupling groove splitting

- **Appearance:** chipping of rubber at edge of decoupling groove, missing micro-sipes, no splitting observed at bottom of the decoupling groove.
- **Action:** no need for removal, tire can remain in service.



CLASS "B" Injuries to sacrificial rib or micro-siping with splitting of the decoupling groove

- **Appearance:** chipping of rubber at edge of decoupling groove, splitting deeper than 2mm observed at bottom of decoupling groove.
- **Action:** remove from service and process for possible retreading.



CLASS "C" Injuries to sacrificial rib or micro-siping with splitting and tearing of the decoupling groove

- **Appearance:** chipping of rubber at edge of decoupling groove, extensive splitting causing tearing and opening of sidewall rubber. This damage starts as a split in the decoupling groove and propagates down the sidewall.
- **Action:** Remove tire from service and dispose.



Supportive material:

- a) TMC "RADIAL TIRE CONDITIONS ANALYSIS GUIDE" fourth edition, page 70.
<https://www.tireindustry.org/tmc-radial-tire-conditions-analysis-guide?page=1>
- b) CVSA 2021 "NORTH AMERICA STANDARD OUT-OF-SERVICE CRITERIA" does not identify Sacrificial Rib / Decoupling Groove damage as an "Out of Service" condition on any front steering axle tire.
<https://www.cvsa.org/inspections/out-of-service-criteria/>