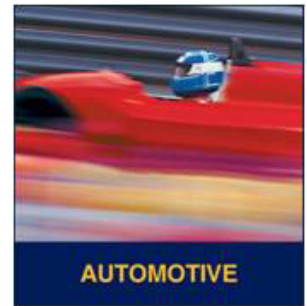


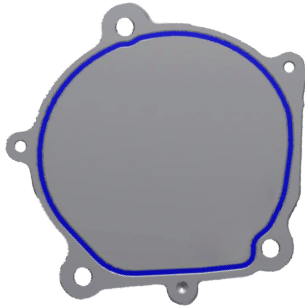
# Problem Solved!

## TECHSEAL INNOVATIONS - PRECISION CUT SEALS FOR WANDERING GROOVES



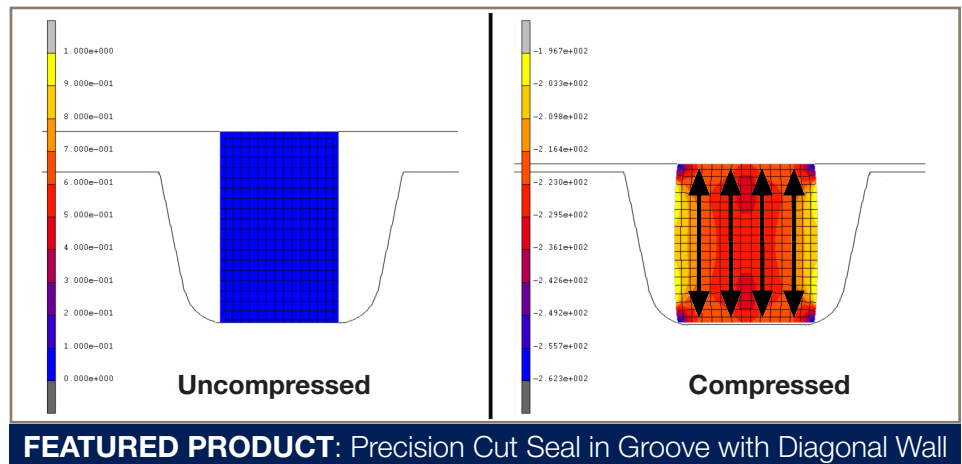
### Application

Vacuum boost pump for an automotive brake system



(These images are illustrations only, not representations of the actual application.)

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### Problem

An automotive component manufacturer was in need of a static face seal for a new vacuum pump. Due to the “wandering\*” seal gland (a.k.a race track groove), limited gland area,

and the slightly diagonal groove walls (see images), a round seal cross section would not stay in the groove after assembly or adequately seal the pump face. The customer was considering

various seal designs with self-retaining ribs to eliminate the assembly issues when TechSeal proposed a simple yet effective solution which is a precision cut seal.

### Parker Solution

TechSeal’s engineering team improved the seal retention after assembly by designing a combination of installation stretch and profile geometry. Installation stretch retains the seal via interference between the seal ID and the groove ID while the rectangular profile prevents the seal from rolling out of the tapered groove. Thanks to this combination, a precision cut seal can properly fit into a wandering groove without the need for a complicated rubber shape, given that the groove’s turning radius meets the standard design parameters.

Precision cut seals provide engineers with a larger degree of design freedom because the profile’s height and width can be independently customized. As a result, the seals were able to accommodate the limited gland area in the vacuum pump’s groove. These seals can also be adjusted for shallow, deep, wide or narrow grooves, adding greater flexibility to the design process. The arrows in the illustration show that the rectangular geometry offers maximum sealing surface contact area and uniform squeeze to the groove.

To learn more about the mechanics of precision cut seals, please view the bulletin “[Rectangular Cross Section Seals](#)” (TSD 5438), available on [parker.com/techseal](http://parker.com/techseal).

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TECHSEAL\_SEALS FOR WANDERING  
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*\*Wandering groove: a seal gland that is not square nor round nor has parallel sides when viewed from above. This typically occurs in applications that require the sealing element to go around bolts, bolt holes, or fasteners.*



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