



Inside Fel-Pro® Valve Stem Seals

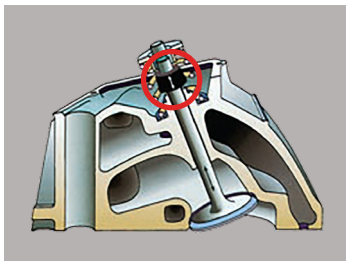
SMALL BUT MIGHTY



Different than other seals in the engine, valve stem seals play an important role in lubrication. Valve stem seals allow a controlled amount of oil to lubricate the valve stem as it moves in the valve guide. The amount of oil that passes by the valve stem seal must be precisely controlled. Too little oil causes stem and guide wear; too much oil causes carbon buildup, leading to valve seat damage, decrease in volumetric efficiency, increased emissions, catalytic converter degradation and excessive oil consumption.

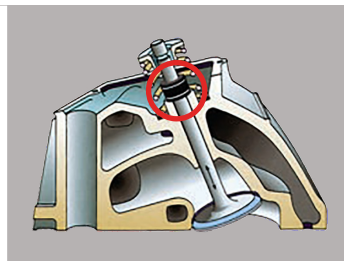
STEM SEAL DESIGNS

There are two basic stem seal designs - deflector and positive seals.



Deflector seals move with valve stem

Also called umbrella seals, these seals deflect oil away from the valve stem. They are secured to the valve stem and move with the valve to shield the valve guide from excess oil.



Positive seals are fixed to the valve guide boss

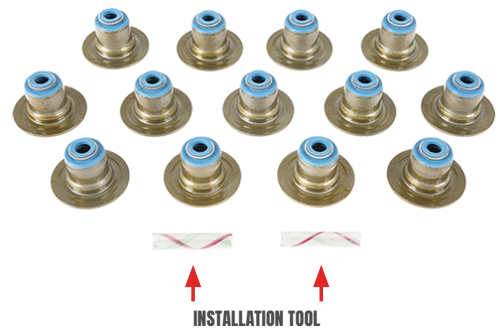
Designed to attach to the valve guide boss and function as squeegees, these seals wipe and meter oil on the stem as they pass through the seals.

FEL-PRO VALVE STEM SEALS

Fel-Pro engineers analyze the OE design for every application. The OE design is tested and benchmarked. Based on the analysis, we determine the material used, considering the durometer (relative hardness) of the rubber, temperature requirements (both extreme heat and extreme cold), resistance to common oil types, tear resistance and leak rate.

This type of analysis makes one thing clear: not all valve stem seals are created equal. Visually, a lower-quality seal may look very similar to a high-quality seal that's appropriate for a given engine platform. However, a lower-quality seal with insufficient heat resistance will harden and crack prematurely and will not work as intended.

You can count on Fel-Pro to use the right material for each application. Fel-Pro uses a variety of materials, including nylon, PTFE, rubber, steel and synthetic rubber, or some combination of these. FKM, fluoroelastomer, is used in many Fel-Pro valve stem seals for hotter-running, late-model vehicles. It is often combined with a metal jacket or covering that totally surrounds the FKM positive seal. FKM offers excellent resistance to both heat (up to 450°F) and abrasion.



On some applications, the valve stem seals are interchangeable between the intake and exhaust valves and will look exactly the same. On applications which use different seals on the intake and exhaust valves, due to needing higher temperature material on the exhaust side or different design, the seals will be bagged and labeled appropriately.

An installation tool is included in all Fel-Pro valve stem seal (VS) sets. This tool is a thin plastic sleeve which is placed over the tip of each valve stem during installation. It protects the inner lip of the seal from damage by the lock grooves in the valve stem.

Visit FelPro.com to learn more about how our gaskets are designed for the repair environment to help seal imperfect sealing surfaces. Find Fel-Pro products with our easy [part finder](#) and products near you with our [part store and repair shop locator](#).

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