Enabling engine downsizing

Environmental benefit

- **Reduced fuel consumption and CO_2 emissions**

SKF offers a new generation of high pressure valve stem seals which enable engine downsizing and hence reduce fuel consumption and CO_2 emissions.

The CO_2 reduction targets in the automotive industry often lead to downsizing the engine and the use of boosting technologies to maintain performance levels. As boosting increases the pressure in the engine manifolds, engine manufacturers need valve stem seals which can withstand the increased pressures to keep the valves lubricated in the valve guides and to minimize wear.

SKF has developed a new generation of high pressure valve stem seals, which address the high pressure requirements. The result is a seal which does not open under high pressure and so provides the correct amount of lubrication to the valve/valve guide interface for long service life and low emissions.

In addition, the friction has been reduced by 50% compared to state of the art high pressure valve stem seals.

Calculations show that a downsized engine can save 270 kg CO_2 per car per year. This is based on a C-class car using a European average annual driven distance of 16 900 km.

SKF BeyondZero solutions can help reduce CO_2 emissions, preserve limited resources and protect the environment from the use and spread of toxic substances. For more details, including documentation of reduced environmental impact, visit www.beyondzero.com

Long-life emissions control

Valve stem seals by SKF provide minimum friction with maximum service life for long-term emissions control

Operational features:

- **Consistent oil lubrication**
- **Minimized valve guide wear**
- **Patented beaded pressure lip design available for all high pressure valve stem seal types**

Operational benefits:

- **Maximum valve train life**
- **Long term emissions control**
- **Lowest friction and power loss**

The new generation of high pressure valve stem seals provide minimized valve guide wear and lowest friction while maintaining their primary function of consistent oil metering even under high pressure.

These seals feature a patented beaded pressure lip designed to retain a lubrication film between the pressure lip and the valve stem even under increased pressure. This flexible lip is pressure activated and designed so that the force to the valve stem is at a minimum in the absence of pressure. At the same time, the main lip design has been optimized to reduce interference and stiffness. The result is a seal design that minimizes friction and valve guide wear for maximum valve-train life.

High pressure valve stem seals have been developed to meet market trends on downsizing and friction reduction. Their patented design also prepares the way for future electrically-operated valves.

In addition, these seals deliver excellent resistance to oils/fuels and high temperatures.

High pressure valve stem seals are suitable for all engines with high pressures in the manifold due to boosting technologies. They are compatible with all conventional and alternative fuels. The patented beaded pressure lip can be incorporated into all types of high pressure valve stem seals by SKF and do not require any change to the installation equipment.

Special high pressure valve stem seals are available for trucks where much higher pressures can arise due to exhaust brakes.

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