



## Oil pressure relief valve bore sleeve for engine oil pump assembly

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An oil pump pressure relief valve system comprised of a steel valve riding in an aluminum housing is susceptible to erratic operation due to both wear of the aluminum and sensitivity to foreign debris. Due to the close proximity of other engine components, the solution cannot result in an increase in the size of the oil pump housing.

A hard sleeve provides increased resistance to wear and debris. A key formed onto the end of the sleeve, which engages a matching keyway in the bottom of the housing bore, provides for proper orientation of the sleeve in the housing. Differing sleeves are error-proofed by varying the angular relationship between the key and the discharge hole in the side of the sleeve.

The sleeve maintains contact with the bottom of the housing bore by means of a spring located between the sleeve and the plug that retains the assembly in the housing. The contact serves to prevent an uncontrolled leak from the high to low pressure sides of the pump, provides the compliance necessary to prevent distortion due to differential thermal expansion, and allows for dimensional tolerances along the axis of the sleeve.

