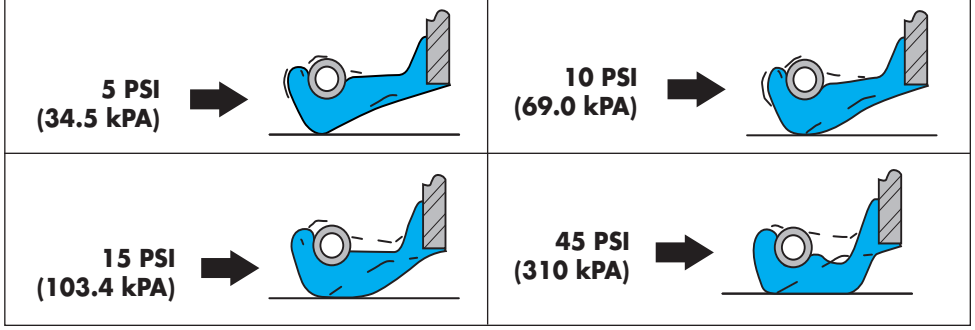
PROPER SEAL SELECTION FOR SYSTEM PRESSURE

A standard oil seal design will handle internal pressures to 5 psi with occasional excursions to 10 psi. The key to the design of an oil seal is the primary lip's ability to follow shaft eccentricity while applying a light load at the lip contact point. The suspended beam construction of the lip, which allows flexibility, is inherently poor in resisting internal system pressure. The figure below shows the effects of pressure on a seal lip from 5 psi to 45 psi.

CONVENTIONAL SEAL LIP DISTORTION AS SYSTEM PRESSURE INCREASES



An oil seal's lip contacts the shaft tracking over the same point as the shaft rotates at high RPM. Minimizing frictional heat, which can shorten seal life, relies on a minimum contact area and load between the seal lip and shaft. As internal pressure increases, both the lip load and the contact area increase, reducing seal life. At pressures approaching 45 psi the beam of the seal can be pressed against the shaft, a condition known as bell mouthing, causing immediate leakage. Wear caused by high pressure is evident on the barrel angle toward the air side of the seal, often with no evidence of wear on the lip contact point.

deVries International oil seals can be designed for higher pressure by increasing the thickness of the lip's flex section or supporting the lip with a backing-ring. These designs are specific to each customer application and require thorough customer testing. The TCHP design is capable of handling pressures to 50 psi. The SCH and SCHH designs, using a reinforced nylon backup, and VTR using reinforced Teflon, are capable of handling pressures well above 100 psi.