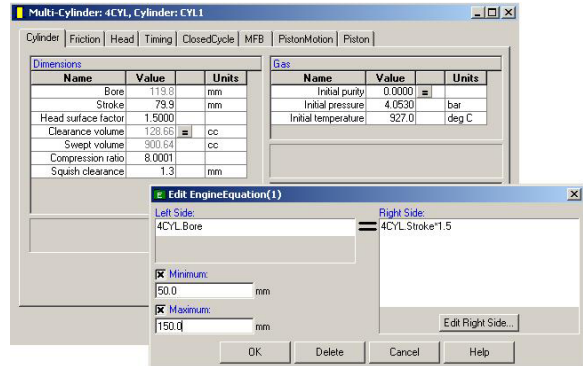


Application Note: PARAMETRIC MODELING

Productivity is a critical issue in engine design as a result of continually shrinking development times and manpower. This is particularly true of engineering software products such as engine performance cycle simulation software, which require detailed input of engine geometry such as poppet valve lift characteristics.

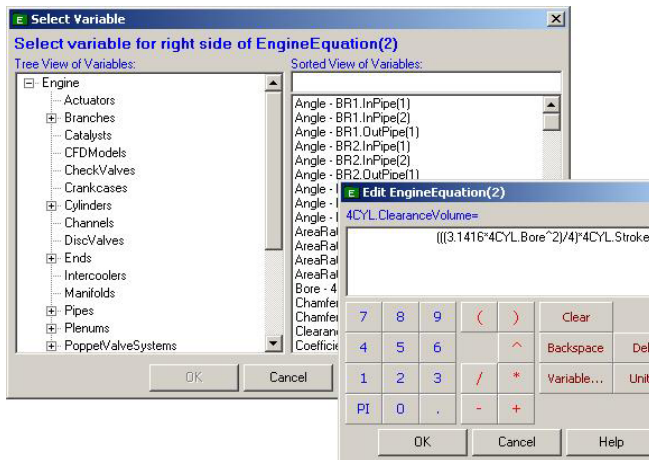
Understanding the need for more efficient engine design software tools OPTIMUM Power Technology's VIRTUAL ENGINES v5.0 now includes the capability of creating complete engine models through the use of parametric equations. The many benefits of such a feature include:

- ❑ Rapid scalability of engine design
- ❑ Building of engine templates
- ❑ Simplified multi-dimensional parametric studies



Equation definition for Bore-Stroke ratio

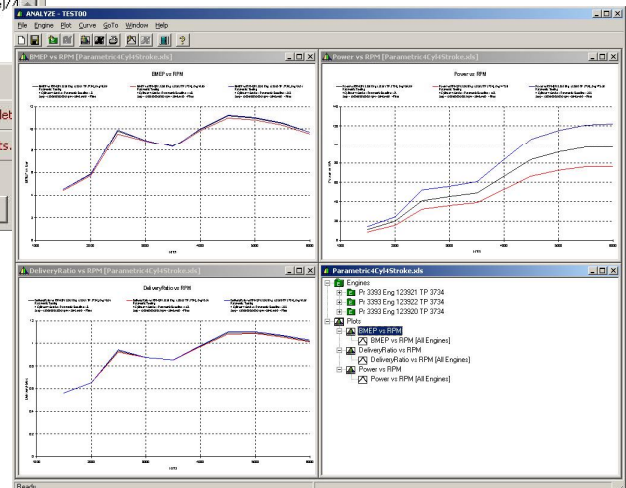
An example of this application is shown below. A 4 cylinder 4-stroke engine has been parameterized to allow investigation of engine power output for various displacements whilst maintaining volumetric efficiency and torque. The engine bore to stroke ratio and compression ratio have been defined to remain fixed irrespective of engine displacement. Poppet valve, intake and exhaust systems have been defined to scale with engine swept volume.



Variable selection and Equation Editor

Maximum flexibility of engine design is supported by:

- ❑ No limitations on the number of equations
- ❑ Full error-checking to assist engineer
- ❑ Select any variable in engine or test procedure for use in equation
- ❑ Embedded equation editor tool for easy definition of complex multiple variable relationships



Performance results – 1.6L, 2.0L, 2.5L