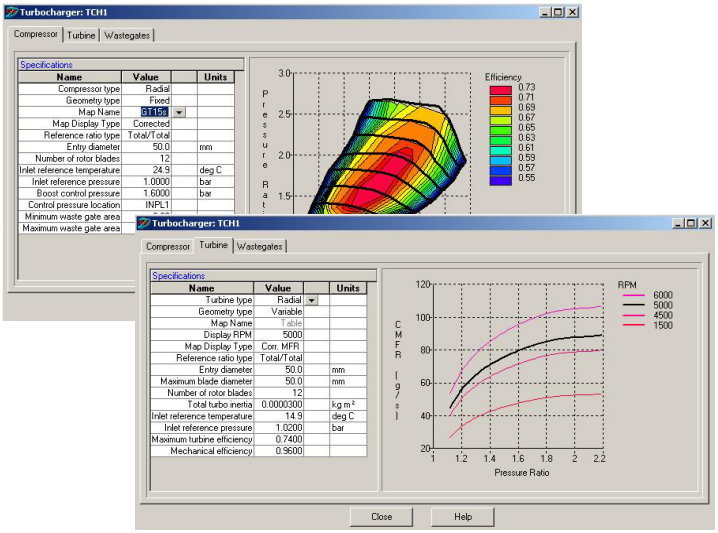
TURBOCHARGING OPTION

OPTIMUM Power Technology offers a major step forward in turbocharger simulation within engine cycle simulation with VIRTUAL ENGINES v5.0.

The application of forced induction in engine design is now widespread. The use of this technology in each new engine design poses challenging problems. What size of turbocharger is required? What characteristics do the compressor and turbine require? How best can this be matched to the engine? VIRTUAL ENGINES provides the means to answer all these questions in a robust, user-friendly engine design environment that supports:

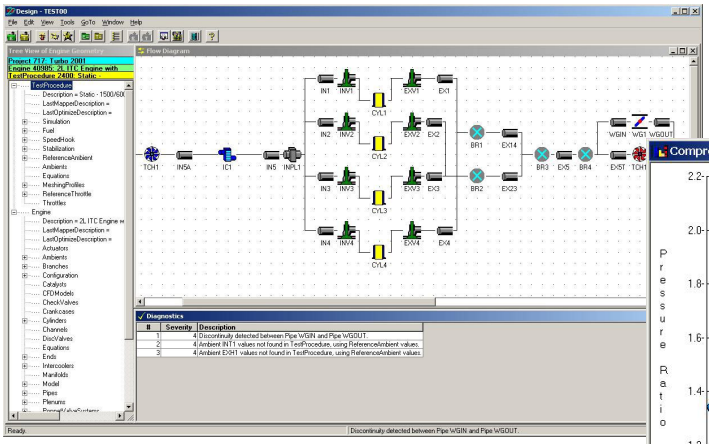
- Easy integration of manufacturer data
- Fixed and Variable Geometry
- Rapid scalability of input map data
- Integrated waste-gate control

Using a unique, full non-isentropic mathematical solver for both compressor and turbine components, VIRTUAL ENGINES is able to predict the impact of each component on the unsteady gas dynamics in both upstream and downstream pipe networks, which directly equates to accurate prediction of engine and turbocharger operation.



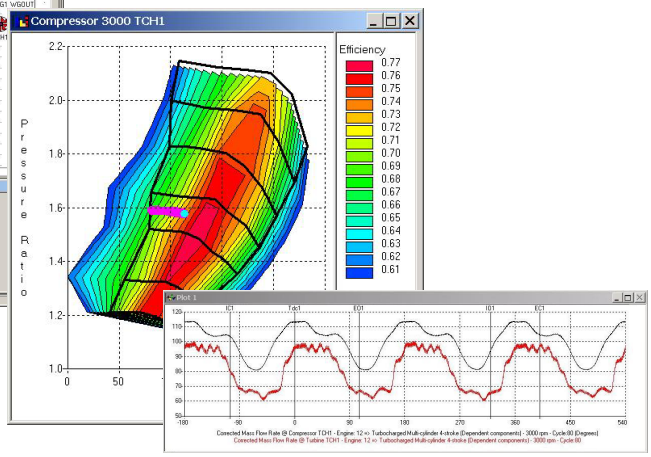
Compressor and VGT specification

Speed, mass flow, pressure ratio and efficiency variations over the engine cycle are computed at every step of the calculation and available to the user through ANIMATE, VIRTUAL ENGINES powerful post-processing application that displays simulation results on a crank-angle basis. Instantaneous operating points over one cycle at a particular engine speed are shown on the compressor map below. Instantaneous mass flow through the compressor and turbine versus crank-angle is also illustrated.



Turbocharged engine model in DESIGN

Compressor and turbine maps can be imported directly onto the VIRTUAL ENGINES database. These can be accessed from any engine model and even scaled to simulate larger or smaller capacity turbochargers where maps may not yet be available.



Post-processor turbocharger analysis