

Internal Combustion Engine Modeling

With *GT-SUITE's* and *CONVERGE CFD's* engine modeling tools, EngSim efficiently models and analyzes many designs, configurations, and operating conditions to quickly understand and optimize an engine system.

Simulation Capabilities

Engine Performance and Efficiency

- Evaluation of base engine specs and architecture
- Valve timing and profile optimization
- Turbocharger matching
- Engine and exhaust system warm-up
- HP and LP EGR studies
- Cooler analysis/sizing

3D CFD

- Full cycle, moving mesh CFD of engine cylinders for mixture motion, mixing, and combustion

Engine Acoustics

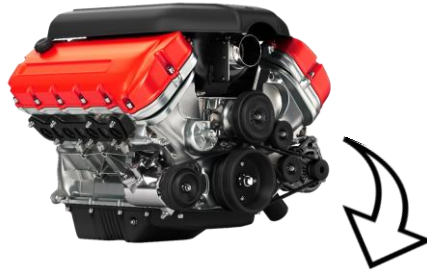
- Intake and exhaust noise analysis
- Intake resonators
- Replication of bench tests
- Internal muffler design

Engine Concepts

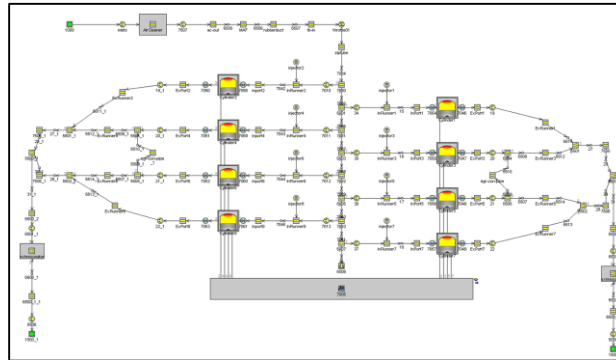
- Novel valve strategies
- Varying piston motion/cycle

Integrated Systems

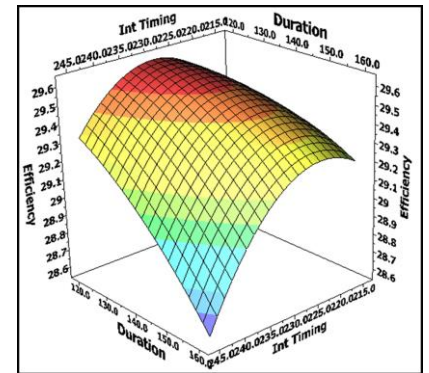
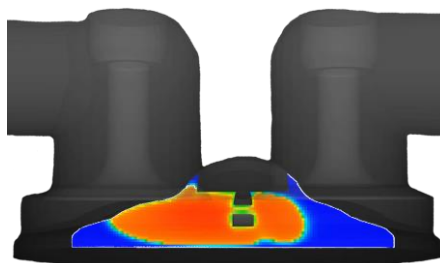
- Vehicle
- Thermal/Cooling
- Valvetrain
- Controls
- Timing Drive



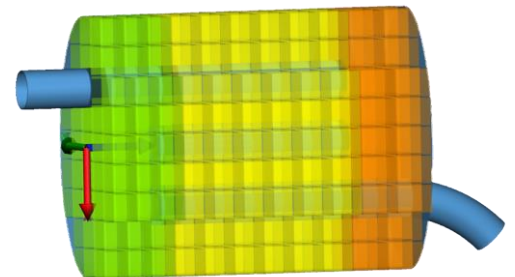
Full engine models can be built with *GT-Suite* and correlated in 1-3 weeks, depending on model complexity. These models can then be used for design analysis or full multi-variable optimization.



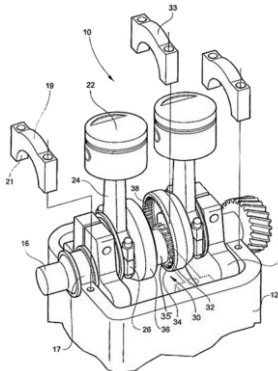
Detailed combustion using *CONVERGE CFD*



Finely discretized muffler for acoustic studies



Concept Lugo crank mechanism



Modeling of multiple integrated vehicle systems

