

Assess and quantify (ICE) oil system GT Suite modelling capability.
 1D Computational Fluid Mechanics (CFD) & Internal Combustion Engine (ICE)
[Aurobay](#) (Powertrain Engineering Sweden)

Assess and quantify (ICE) oil system GT Suite modelling capability.

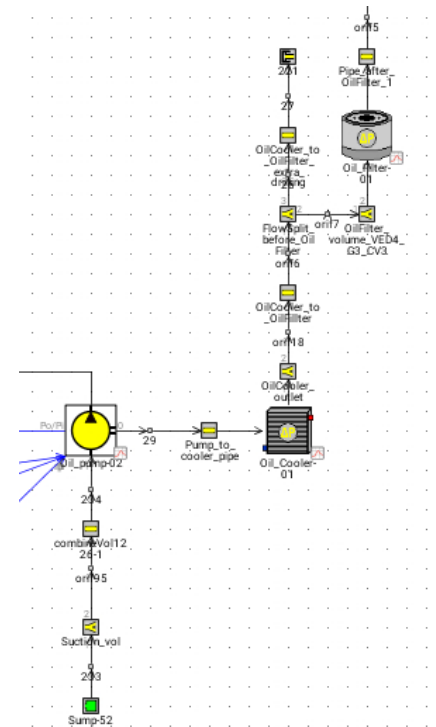
Introduction

At Aurobay we use GT Suite as tool for modelling the oil circuit in an Internal Combustion Engine (ICE). As an important part of our process, we validate/calibrate our models against testing data, mainly steady state (SS) running conditions. However, we need to improve our processes and methods. There are many aspects to work on, e.g. model fidelity, computational effectiveness, calibration methodology. Our main focus is SS, but we also see that transients become interesting for certain questions.

Project description

Depending on the student's personal interest and skills we can put together a scope consisting of

- SS operation (Test data exists)
 - Pressurized part
 - Model fidelity/sensitivity study on different components. E.g. pump, cooler.
 - Assessing model calibration and validity @ other running conditions
 - Computational time (effort) vs. accuracy. I.e. effectiveness (space and time resolution)
 - Pressurized part + return flow and oil pan (both new!!)
 - Add thermal effects in SS
- Calibration methodology. Is there a better way to find/get a more robust calibration?
 Can we use automation and optimization for this and what data does that require?



Small part of complete GT Suite Oil system model including important components

Assess and quantify (ICE) oil system GT Suite modelling capability.
1D Computational Fluid Mechanics (CFD) & Internal Combustion Engine (ICE)
[Aurobay](#) (Powertrain Engineering Sweden)

- Transient operation. I.e. extend the learnings and methodologies from SS to this.
(Very limited data)

Student background and personal characteristics

Fluid dynamics with knowledge in Computational Fluid Dynamics (CFD 1D). For some of the methodology questions an interest in mathematics and optimization is beneficial.

Contact @Aurobay

Lars-Olof Carlsson, Senior CAE engineer at CAE Fluids

E-Mail: lars-olof.carlsson@volvocars.com