

MODEL BASED CATALYST CONTROL FOR GASOLINE ENGINES



Background

The vehicle emission legislation becomes more and more strict which requires more precise control functions. Traditional catalyst control normally consists of a binary lambda sensor switch type feedback control which has proven to be robust and efficient. However, a model based control function has potential to improve the system performance by utilizing the complete catalyst volume in an optimal way. Initial work of such a model has been performed, but the model needs to be further developed and calibrated. Experiments and data collection on real emission systems will be an important activity.

Objectives

- Through literature and documentation of the current model, get an overview of the current status
- Conduct experiments in engine test bench to collect space resolved data for reaction rates in the catalyst
- Continue development of a control oriented catalyst model
- Develop prototype SW for vehicle tests
- Make an initial calibration for the model
- Evaluate the model in a real-world application
- Summarize benefits and disadvantages compared to the traditional approach

Activities

- Literature study
- Model development in Simulink
- Model calibration in INCA
- Engine and vehicle tests

Micellaneous

- Scope of work is suitable for two students
- Vehicle tests to be performed at VCC, Gothenburg
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