

# Project report

## Project 1C – TSFS09

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### 1 Examination requirements

The objective of this project is to integrate your submodels into Simulink, develop a fuel controller, and investigate the performance of your engine and controller during a 600 second drive cycle. The report should include:

Plots of

- the air/fuel-ratio performance of your feedforward controller,
- the air/fuel-ratio performance of your complete controller (feedforward and feedback),
- the velocity, intake pressure, exhaust pressure, and Torque signals.

Also, you should include

- tables of your emissions performance with the corresponding EURO limits (one with only feedforward control, and one with both feedforward and feedback)
- and your calculated fuel efficiency in litre per 100 km.

**Note:** Screen captures of scopes are **not ok**. Use **To Workspace**-blocks to extract data from Simulink to Matlab, and use the standard `plot()` command. Label your axes properly.

## 2 Assignments

### 2.1 $\lambda$ -control: feedforward

### 2.2 $\lambda$ -control: feedforward + feedback

### 2.3 Velocity, Intake Pressure, Exhaust Pressure, and Torque

### 2.4 Emissions & Fuel Consumption

Table 1: Emissions performance with only feedforward control.

<b>Emission</b>	<b>Result</b>	<b>EURO3</b>	<b>EURO4</b>
CO	?	2.30	1.00
HC	?	0.20	0.10
NOx	?	0.15	0.08

Table 2: Emissions performance with the full controller.

<b>Emission</b>	<b>Result</b>	<b>EURO3</b>	<b>EURO4</b>
CO	?	2.30	1.00
HC	?	0.20	0.10
NOx	?	0.15	0.08