

Project report

Project 1C – TSFS09

Name1 – email1

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1 Examination requirements

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

Plots of

- the intake manifold pressure and its reference signal using only the throttle feedforward controller,
- the intake manifold pressure and its reference signal, as well as the intercooler pressure and its reference signal, using your complete controller (feedforward and feedback, throttle and wastegate),
- the velocity and torque signals.

Also, you should include

- tables of your emissions performance with the corresponding EURO limits (using feedforward and feedback boost control),
- and your calculated fuel efficiency in litre per 100 km, for both $\Delta p = 10$ kPa and $\Delta p = 30$ kPa.

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 Boost control: feedforward

2.2 Boost control: feedforward + feedback

2.3 Velocity and torque

2.4 Emissions & Fuel Consumption

Table 1: Emissions performance with the full boost controller.

Emission	Result	EURO3	EURO4
CO	?	2.30	1.00
HC	?	0.20	0.10
NOx	?	0.15	0.08