

Modelling for Control of Exhaust Gas Recirculation on Large Diesel Engines - DTU Orbit (09/11/2017)

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Exhaust Gas Recirculation (EGR) reduces NO_x emissions by reducing O₂ concentration for the combustion and is a preferred way to obtain emission regulations that will take effect from 2016. If not properly controlled, reduction of O₂ has adverse side effects and proper control requires proper dynamic models. While literature is rich on four-stroke automotive engines, this paper considers two-stroke engines and develops a non-linear dynamic model of the exhaust gas system. Parameters are determined by system identification. The paper uses black-box nonlinear model identification and modelling from first principles followed by parameter identification and compares the results of these approaches. The paper performs a validation against experimental data from a test engine and presents a linearised model for EGR control design.

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