

# **NO<sub>x</sub> ADSORBERS FOR HEAVY-DUTY TRUCK ENGINES – TESTING AND SIMULATION**

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This feasibility study of NO<sub>x</sub> adsorbers in heavy-duty diesel engines examined three configurations (dual-leg, single-leg, and single-leg-bypass) in an integrated experimental setup, composed of a Detroit Diesel Class-8 truck engine, a catalyzed diesel particulate filter, and the NO<sub>x</sub> absorber system. The setup also employed a reductant injection concept, sensors, and advanced control strategies.

The study included the development of thermal and empirical NO<sub>x</sub> absorber characteristic models. These models were further applied to the development of regeneration strategies and were used for a comparative performance analysis of the three NO<sub>x</sub> adsorber configurations.

The reported steady-state experimental and simulation results show relatively high NO<sub>x</sub> conversion efficiencies, with various levels of fuel economy deterioration. Further, the findings confirm that the development of acceptable regeneration and desulfation control logics is a major technical challenge for practical NO<sub>x</sub> absorber system applications. These logics are further complicated by such factors as engine transient operation, drivability, and durability.