



REWARD

REal World Advanced Technologies for Diesel Engines

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Project partners:

- 1 - AVL - AVL List GmbH - AT
- 2 - REN - Renault SAS - FR
- 3 - VCC - Volvo Car Corporation - SE
- 4 - CRF - CRF SCpA - IT
- 5 - CNRIM - Istituto Motori – Consiglio Nazionale delle Ricerche (CNR) - IT
- 6 - JM - Johnson Matthey Plc - UK
- 7 - RIC - Ricardo Plc - UK
- 8 - SCF - Schaeffler Technologies AG & Co. KG - DE
- 9 - LMM - Le Moteur Moderne - FR
- 10 - DELPHI - Delphi Automotive Systems Luxembourg S.A. - LU
- 11 - UNR - Uniresearch BV - NL
- 12 - IFPEN - IFP Energies Nouvelles - FR
- 13 - VIF - Virtual Vehicle Research Center - AT
- 14 - CTH - Chalmers Tekniska Högskola - SE
- 15 - CTU - Czech Technical University - CZ
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Executive summary

Because of part-to-part dispersions and extended RDE conditions, engine out emissions of Diesel engines are more and more scattered. In parallel, in-cylinder pressure sensor is a mature technology and can be used in control strategies to increase robustness of the systems. This deliverable report is composed of two parts, addressing two ways of using the in-cylinder pressure sensor.

On the one hand, an in-cylinder mass estimation strategy is detailed, using physical modeling of the compression phase. This study stresses the sensitivity of the estimation regarding to model parameters. It shows that such strategies cannot be better than classical measurement methods (namely mass flow measurement).

On the other hand, the second study suggests to exploit all the information included in the cylinder pressure trace. Through mathematical dimension reduction method, the cylinder pressure trace is reduced to few parameters, without loss of information. In order to evaluate the potential of such a method to be a solution for OBD or control purpose, we analyze the correlation between the parameters and the engine outputs, using mathematical modeling such as artificial neural networks or krigging models. The methodology used is presented in deliverable report D5.9 Implementation of OBD and control algorithms in the engine ECU to which it is highly linked.