PaREGEn

Particle Reduced, Efficient Gasoline Engines

EUROPEAN COMMISSION
Horizon 2020 | GV-2-2016 | Technologies for low emission light duty powertrains
GA # 723954

Deliverable No.	PaREGEn D3.5	
Deliverable Title	Report on measured turbocharger map, engine testing and simulation report from Task 3.5.2	
Deliverable Date	2019-06-23	
Deliverable Type	REPORT	
Dissemination level	Confidential – member only (CO)	
Written By	Tamara Ottenwälder (FEV) Tobias Vosshall (VKA) Dominik Lückmann (FEV) Jens Ewald (FEV)	2019-06-23
Checked by	Normann Freisinger (DAI)	2019-07-08
Approved by	Normann Freisinger (DAI) Niall Turner (JLR) Simon Edwards (RIC) - Coordinator	2019-07-08 2019-07-27 2019-07-29
Status	Final	2019-07-29

Publishable Summary

In this report, the thermodynamic testing results for the turbocharger and the engine on FEV testing facilities are given. Test results are referring to the chosen hardware. The hardware is as selected in WP3 and delivered by the work package partner Daimler.

In the first testing subsection, the results related to the twin-scroll turbocharger on the turbocharger hot test gas stand are presented. These results were used to validate and finally update the compressor and turbocharger maps in the GT-POWER gas exchange simulation model that was used to generate the thermodynamic boundary conditions in the simulation report D3.2.

In the subsection that follows, the thermodynamic engine testing results from the Daimler research engine YE3020 are shown: this was equipped with the DI water injection system and was run with two different piston types such that the effect of increased compression ratio could be investigated (CR=11.7:1 and CR=13.5:1). Also, the exhaust gas condensation system was installed in the exhaust path and exhaust gas condensate was collected.

Finally, a comparison between the thermodynamic behaviour of the engine with no DI water injection, water injection using purified water from an osmosis system, and water from the exhaust condensate system is shown. The engine testing activities have been recorded to support further simulation and optimisation activities.

Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners:

#	Partner	Partner Full Name
1	RIC	RICARDO UK LIMITED
2	DAI	DAIMLER AG
3	JLR	JAGUAR LAND ROVER LIMITED
4	BOSCH	ROBERT BOSCH GMBH
5	FEV	FEV EUROPE GMBH
6	JM	JOHNSON MATTHEY PLC
7	HON	HONEYWELL, SPOL. S.R.O.
8	JRC	JOINT RESEARCH CENTRE – EUROPEAN COMMISSION
9	UNR	UNIRESEARCH BV
10	IDIADA	IDIADA AUTOMOTIVE TECHNOLOGY SA
11	SIEMENS	SIEMENS INDUSTRY SOFTWARE SAS
12	LOGE	LUND COMBUSTION ENGINEERING LOGE AB
13	ETH	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH
14	UDE	UNIVERSITAET DUISBURG-ESSEN
15	RWTH	RWTH AACHEN UNIVERSITY
16	UFI	UFI FILTERS SPA
17	UOB	UNIVERSITY OF BRIGHTON
18	GARR	GARRETT–ADVANCING MOTION