Proceedings of the FISITA 2012 World Automotive Congress

Volume 1: Advanced Internal Combustion Engines (I)

Bearbeitet von
SAE-China, FISITA

ISBN 978 3 642 33840 3
Format (B x L): 15,5 x 23,5 cm
Gewicht: 1515 g

Zu Leseprobe

schnell und portofrei erhältlich bei

beck-shop.de
Contents

Part I New Gasoline Direct Injection (GDI), Spark Ignition (SI) and Compression Ignition (CI) Engines and Components

A Novel Mechanism for Piston Deactivation Improving the Part Load Performances of Multi Cylinder Engines .......... 3
F2012-A01-003
Alberto Boretti and Joseph Scalzo

Novel Crankshaft Mechanism and Regenerative Braking System to Improve the Fuel Economy of Passenger Cars ............. 19
F2012-A01-004
Alberto Boretti and Joseph Scalzo

Experimental Investigation on Fuel Spray Optimization in Gasoline Direct Injection Engine ................................. 45
F2012-A01-006
Bo Jiang, Xiaoliang Pan, Fafa Liu, Chaojun Wang and Xiaochuan Feng

Improvement of Fuel Economy and Vehicle Performance Through Pneumatic Regenerative Engine Braking Device (Reneged) .......... 55
F2012-A01-012
Yan Zhang, Choyu Lee, Hua Zhao, Tom Ma, Jing Feng, Zhiqiang Lin and Jie Shen

CAI Combustion of Gasoline and its Mixture with Ethanol in a 2-Stroke Poppet Valve DI Gasoline Engine .................. 67
F2012-A01-013
Yan Zhang, Hua Zhao, Mohammed Ojapah and Alasdair Cairns
Technologies for the Next Generation of Downsized Gasoline Engines ........................................ 83
F2012-A01-016
Paul Freeland, James Taylor, Dave OudeNijeweme, Marco Warth and Bernd Mahr

Control System Development for Gasoline HCCI Engine Which Based on Heat Management .................. 95
F2012-A01-019
Jianyong Zhang, Zhen Huang, Qi Yin, Yitao Shen, Lin Chen and Shiliang Lv

The Effect of Advanced Combustion Control Features on the Performance of a Highly Downsized Gasoline Engine .......... 105
F2012-A01-021
Karl Giles, Andrew Lewis, Sam Akehurst, Chris Brace and Nick Luard

HCCI Cycle-by-Cycle Combustion Phase Control Based on Ion Current Technology in GDI Engine ............... 119
F2012-A01-023
Zhiyong Zhang, Liguang Li and Robert Dibble

Efforts on Fuel Economy Improvement of 1.3 L TGDI Gasoline Engine ........................................ 135
F2012-A01-024
Chen Yang, Yuan Shen, Yi You and Fuquan Zhao

Development of Two-Stage Turbocharger System with Electric Supercharger .................................... 147
F2012-A01-026
Byeongil An, Hiroshi Suzuki, Motoki Ebisu and Hedeyuki Tanaka

F2012-A01-027
Xuedong Lin, Fang-en Yuan and Ya Huang

Analysis of the Wear Behavior of Combustion Engine Components Using Radionuclide-Technique ............ 171
F2012-A01-030
Tamás Gergye, Mathias Roman Dreyer, Bernhard Kehrwal and Wolfgang Optatzy
A Super Clean Diesel Vehicle for US LEV-III SULEV Category: Second Report; Advanced A/F Control for NOx Reduction and for SCR Heat Up ........................................... 183
F2012-A01-031
Jean Balland, Bart Schreurs, Michel Peters, Michael Parmentier, Julien Schmitt, Hans Hardam, Masatoshi Yamada, Hiroshi Uike, Toshiharu Takahashi, Yuji Yasui, Eiji Hashimoto, Hideki Matsunaga and Naohiro Sato

Research on Low Temperature Combustion of Homogeneous Charge Induced Ignition (HCII) in a Light-Duty Diesel Engine .................... 195
F2012-A01-033
Chao Yu, Jianxin Wang, Wenbin Yu, Jichun Liu and Dingwei Gao

The Impact of Modified Piston in Two Stroke Engine on Toxic Emissions and Fuel Consumption .............................................. 205
F2012-A01-039
Jerzy Merkisz, Maciej Bajerlein, Łukasz Rymaniak and Andrzej Ziółkowski

Multi-Coil High Frequency Spark Ignition to Extend Diluted Combustion Limits ....................................................... 217
F2012-A01-040
Shui Yu, Xiaoye Han, Kelvin Xie, Meiping Wang, Liguang Li, Jimi Tjong and Ming Zheng

Multiple Injection and Boosting Benefits for Improved Fuel Consumption on a Spray Guided Direct Injection Gasoline Engine . . . 229
F2012-A01-041
Jason King and Oliver Böcker

Gray Cast Iron Cylinder Head Thermal Mechanical Fatigue Analysis ................................................................. 243
F2012-A01-042
Jun Li, Pengcheng Wang, Xiaojuan Cui, Kang Li and Rentao Yi

Development of FAW 2.0 L Turbocharged Gasoline Direct Injection Engine .................................................. 259
F2012-A01-043
Jun Li, Jincheng Li, Yanfeng Gong, Haie Chen, MeiLan Qu, Jinyu Liu, Wei Li, Chunyu Xia, Huili Dou, Lei Fu, Xian Li and Tiejun Shen
Faw V6 High Performance Gasoline Engine for Executive Class Car ................................... 275
F2012-A01-044
Jun Li, Jincheng Li, Jianlong Song, Jinyu Liu, Weixing Hu, Yingjie Liu, Tao Yan, Linghai Han, Enwei Jiang, Zhengyong Liu and Tian Xia

Air System Proposal and Testing for a Downsized Two-Stroke Diesel Engine ........................................ 289
F2012-A01-045
Pavel Brynych, Jan Macek, Luděk Pohořelský, Jean-Charles Ricaud, Pierre-Yves Vallaude, Pascal Tribotté and Philippe Obernesser

Part II Fuel Injection and Sprays

Spray Characteristics of a Fuel Injector: A CFD Study ............... 317
F2012-A02-003
J. Suresh Kumar, V. Ganesan, J. M. Mallikarjuna and S. Govindarajan

Co-Simulation Modeling of High-Pressure Fuel System and Engine Performance System and Control System in Common Rail Diesel Engine ........................................ 331
F2012-A02-008
Xinglan Xia, Kang Xu, Yin Liu, Min Liu, Shengli Wang and Chao Ma

Applying a Diesel Spray Model With Different Size Distribution Functions to High Pressure Diesel Spray Cases ................. 351
F2012-A02-011
Emekwuru G. Nwabueze

Influence of Diesel Surrogates on the Behavior of Simplified Spray Models ................................................. 361
F2012-A02-012
Jonas Galle and Verhelst Sebastian

Coupled 1D/2D/3D Modeling of Common Rail Injector Flow and Nozzle Cavitation .................................... 375
F2012-A02-013
Valdas Čaika, Peter Sampl and David Greif

Predicting the Effect of Fuel Path Controllable Parameters on the Performance of Combustion Controlled Diesel Engine .......... 387
F2012-A02-014
Zhijia Yang and Richard Stobart
Influence of Biocellulose Derived Fuel Blends on Injection Properties ...................................................... 401
F2012-A02-015
Sorin Sacareanu, Anghel Chiru, Alexandru Bogdan Muntean and Cornel Stan

Research on the Effect of the Parameters of Common-Rail System on the Injection Rate .......................... 411
F2012-A02-016
Guanjun Yu, Liguang Li, Jun Deng, Zhiqiang Zhang and Lin Yu

The Influence of Diesel Nozzle Structure on Internal Flow Characteristics .............................................. 421
F2012-A02-017
Weidi Huang, Zhijun Wu, Ya Gao, Huifeng Gong, Zongjie Hu, Liguang Li and Furu Zhuang

Analysis of Internal Flow Characteristics for GDI Injector .......... 433
F2012-A02-018
Bowen Zou, Shichun Yang, Kaiguo Li, Jingbo Li and Jungang Liu

Characteristics of Flash Boiling Fuel Sprays from Three Types of Injector for Spark Ignition Direct Injection (SIDI) Engines ...... 443
F2012-A02-019
Gaoming Zhang, Min Xu, Yuyin Zhang and David L. S. Hung

Part III Fuel and Lubricants

World's First 100 % LPG Long Haul Truck Conversion .................. 457
F2012-A03-008
Alberto Boretti and Charles Grummisch

Analysis of Engine Oil Containing MoDTC on the Thermo-Oxidation Engine Oil Simulation Test (TEOST 33C) ...................... 475
F2012-A03-009
Linchun Wang, Liping Wang and Guiyun Li

Effect of Ash-Less Antioxidants on Fuel Efficiency Retention of PCMO Containing MoDTC .......................... 483
F2012-A03-010
Liping Wang, Linchun Wang, Guiyun Li and Xiaohong Xu
Semi-Empirical Correlations of Physical and Chemical Delay Period of Diesel-Gasoline Combustion ........................ 493
F2012-A03-011
Wei Jet Thoo, Arman Kevric, Hoon Kiat Ng, Suyin Gan and Paul Shayler

The Energetic Potential of Engines Fueled with Biomass Derived Products. .......................... 503
F2012-A03-016
Anghel Chiru, Sorin Sacareanu, Ruxandra-Cristina Stanescu, Cornel Stan and Peter Zima

Fuel Formulation for Future Drive Train Developments .......................... 515
F2012-A03-017
Máté Zöldy, András Holló, Zoltán Szerencsés, Ferenc Kovács and Róbert Auer

MoS₂ Production Mechanism of MoDTC .......................... 525
F2012-A03-018
Kazuhiro Umehara, Yukio Tatsumi and Noriyoshi Tanaka

Research on Cam & Tappet Friction Test Method for Anti-Wear Performance Evaluation of Engine Oil .......................... 533
F2012-A03-020
Chensheng Zou, Shengjun Huang and Jun Yu

An Experimental Study on Biodiesel Characteristics in a Common Rail Direct Injection Diesel Engine .......................... 545
F2012-A03-021
Jae-Woong Kim, Hyung-Ik Kim, Yung-Jin Kim and Ki-Hyung Lee

Engine Oil Antioxidant Selection for Delivering Superior Oxidation and Deposit Control Protection .......................... 559
F2012-A03-023
Bo Liu and Vince Gatto

Experimental Study of Influence of Gasoline Fuel with MMT on Aging Performance of Three-Way Catalyst .......................... 571
F2012-A03-024
Shijin Shuai, Yinhui Wang, Junfeng Chen and Jianhua Xiao
Part IV  After Treatment and Emission Control

Study on Engine Performance Influenced by External Cooled EGR ........................................... 587
F2012-A04-004
Nan Jiang, Jifeng Liu, Xueen Zhang, Xiaojun Cheng, Yang Yang, Jianxian Chen, Gan Chen, Jianguang Zhou, Yongsheng Long and Jie Bai

The Study on the Capacity of NOx Storage-Reduction Catalyst for Lean-Burn Engine .......................... 599
F2012-A04-005
Jianqiang Wang, Yuan Wang, Shuangxi Liu, Jidong Gao, Jie Ma and Meiqing Shen

New Techniques for Damage Assessment of Diesel Particulate Filters ............................................ 609
F2012-A04-006
Tim Hands and Qiang Li

Dilution Air Refine System Used in Formaldehyde Measurement ............................................. 625
F2012-A04-007
Peipei Dai and Yunshan Ge

A Study of SIC-Nanoparticles Porous Layer Formed on SIC-DPF Wall for Soot Oxidation .................. 633
F2012-A04-008
Keita Ishizaki, Shinichi Tanaka, Atsushi Kishimoto, Masamichi Tanaka, Naoki Ohya and Nobuhiro Hidaka

Enhancement of Regeneration Performance by a New Catalyzed DPF ........................................ 645
F2012-A04-011
Takeshi Matsumoto, Takeshi Mori, Satoshi Hirose, and Hiroto Takeuchi

Three Way Catalyst Modeling for HEV After Treatment System Design ......................................... 661
F2012-A04-012
Masayuki Tani, Masaaki Kubo and Shigemasa Shimojo
Investigations of Ammonia Emissions from Euro 5 Passenger Cars Over a Legislative Driving Cycle ................ 671
Piotr Bielaczyc, Andrzej Szczotka, Antoni Swiatek and Joseph Woodburn

A Study on Regulated and Unregulated Emissions from a Set of Five Gasoline and Ethanol Fueled Motorcycles. ............... 687
Renato Penteado, Luiz Carlos Daemme, Jürgen Krahl and Fátima Zotin

Strategies to Control Particulate Emissions of Gasoline Direct Injection Engines. ........................................ 699
Oliver Berkemeier, Klemens Grieser, Kay Hohenboeken, Evangelos Karvounis and K. Moritz Springer

A New Environmental Friendly Zirconium–Titanic–Ceria–Tungsten Mixed Oxides for Durable NH3-SCR deNOx Catalysts ........... 715
Jianqiang Wang, Jidong Gao, Jie Ma and Meiqing Shen

Under Actuated Air Path Control of Diesel Engines for Low Emissions and High Efficiency ......................... 725
Chris Criens, Frank Willems and Maarten Steinbuch

A Novel Alkali-Catalyzed Alpha-Alumina DPF with High Catalytic Activity and Durability .......................... 739
Keisuke Mizutani, Kensuke Takizawa, Hironobu Shimokawa, Shuhei Oe and Naohisa Ohyama

A Super Clean Diesel Vehicle for us LEV III SULEV Category ..... 753
Yuji Yasui, Hideki Matsunaga, Eiji Hashimoto, Naohiro Satoh, Bart Schreurs, Hans Hardam, Masatoshi Yamada and Toshiharu Takahashi

The Application of Nanometric Composite Materials in a Diesel Engine in the Aspect of Improvement of Deep Bed Filtration in a Diesel Particulate Filter ............. 767
Jerzy Merkisz, Pawel Fuc, Piotr Lijewski and Andrzej Ziolkowski
Study on the PM2.5 and Ultra Fine PM Characteristics of Diesel Vehicle with DPF Under the Different Driving Conditions ............ 779
F2012-A04-034
Mengliang Li, Xiong Chen, Jiguang Wang and Yueyun Xu

The Model Based Control Strategy for an Advanced UREA-SCR System .................................................. 789
F2012-A04-036
Zhi Liu, Hongrong Wang and Yongfu Wang

The NOx Conversion Efficiency Depending on the Deviation of SCR System Components and Amount of Soot Loading in c-DPF .......................................................... 799
F2012-A04-041
Hyoung Sik Kim, Jong Ik Jeon, Chang Eun Choi and Won Kun Kim

Detailed Investigation of Filtration and Regeneration Processes in a Diesel Particulate Filter System ......................... 811
F2012-A04-045
Seungmok Choi and Kyeong Lee

Part V Flow and Combustion Diagnosis

Simulation of EGR Stratification on Timing-Sequential Regionalized Diesel Combustion ............................................. 827
F2012-A05-004
Zhaojie Shen, Zhongchang Liu, Jing Tian, Kang Li and Jiangwei Liu

Investigation on the Validity Region of Online Combustion and Torque Models of Gasoline Engines With Retarded Ignition .... 839
F2012-A05-007
Fangwu Ma and Zheng Qu

Development of Real Time Inlet Air Model of Diesel Engine Based on ‘V’ Cycle Mode .................................................. 853
F2012-A05-010
Chao Ma, Yong Hang, Xiaowu Gong and Fu Wang

CFD Simulation and Optical Engine Diagnostics of Mixture Formation Processes in DI Gasoline Engine with Flexible Valvetrain .................................................. 865
F2012-A05-011
Yi Zheng, Po-I Lee, Atsushi Matsumoto, Xingbin Xie and Ming-Chia Lai
Multidimensional CFD Simulation of a Diesel Engine Combustion: 
A Comparison of Combustion Models .......................... 879
F2012-A05-012
Arif Budiyanto, Bambang Sugiarto and Bagus Anang

Part VI  Engine Design and Simulation

Dual Fuel CNG-Diesel Heavy Duty Truck Engines 
with Optimum Speed Power Turbine .......................... 897
F2012-A06-003
Alberto Boretti

The Effect of Intake Port Shape on Gasoline Engine 
Combustion in Cylinder ........................................ 921
F2012-A06-006
Xiaodong Chen and Zhangsong Zhan

Cycle-Resolved Computations of Stratified-Charge 
Turbulent Combustion in Direct Injection Engines .......... 931
F2012-A06-007
Tomoaki Kubota, Nobuhiro Shinmura and Ken Naitoh

Research on Torque-Angle Tightening of High Strength Bolt 
in Internal Combustion Engine ................................. 941
F2012-A06-016
Wenfeng Zhan, Jian Wu, Fake Shao and Chuhua Huang

Computational Study of Soot Entrainment via Thermophoretic 
Deposition and Crevice Flow in a Diesel Engine ............ 951
F2012-A06-017
Shin Mei Tan, Hoon Kiat Ng and Suyin Gan

Experiment and Numerical Analysis of Temperature Field 
of Cylinder Head Based on a GW4D20 Diesel Engine .......... 965
F2012-A06-018
Baoxin Zhao, Dingwei Gao, Jingqian Shen, Zheng Zhao, 
Hao Guan, Gang Liu and Ying Guan

Development and Validation of a Quasi-Dimensional Model 
for (M)Ethanol-Fuelled SI Engines ............................ 977
F2012-A06-019
Jeroen Vancoillie, Louis Sileghem, Joachim Demuynck 
and Sebastian Verhelst
A Development of Simplified Turbocharger Transient
Heat Transfer Simulation Method (First Report) .......... 995
F2012-A06-020
Kyung Sub Sung, Kil Min Moon, Dong Ho Chu and Sang Joon Park

A Detailed Analysis of the Initiation of Abnormal Combustion
with Reaction Kinetics and Multi-cycle Simulation .......... 1007
F2012-A06-021
Michael Heiss, Nikola Bobicic, Thomas Lauer, Bernhard Geringer
and Simon Schmuck-Soldan

Modeling of Six Cylinder Diesel Engine Crankshafts to Verify
Belt Load Limits ............................................. 1019
F2012-A06-022
Kumar B. Dinesh, M. Nagarajan, Patil Shankar, P. Mahesh
and N. Muralitharan

Model-Based Control and Calibration for Air-Intake Systems
in Turbocharged Spark-Ignition Engines .................... 1029
F2012-A06-026
Kunihiko Suzuki and Seiji Asano

Study on Dynamics Modeling and Analysis of Valvetrains ...... 1043
F2012-A06-028
Caiyun Guan, Wenjie Qin and Xiaobo Wang

Mechanistic Modeling in System Engineering: Real-Time
Capable Simulation of a TGDI Engine Powered Vehicle .... 1055
F2012-A06-032
Johann C. Wurzenberger, Titina Banjac, Roman Heinzle
and Tomaz Katrasnik

A Multi Zone Spray and Combustion Model for Formation
of Polycyclic Aromatic Hydrocarbons and Soot
in Diesel Engines ........................................... 1069
F2012-A06-037
Ali Salavati-Zadeh, Vahid Esfahanian, Asghar Afshari
and Mahdi Ramezani

Evaluation of Crank Mounted Fan for TV and Crankshaft
First Journal Bearing MOFT Analysis for 3.8 L 4 cyl.
Diesel Water Cooled Engine ................................ 1079
F2012-A06-038
V. Sandeep, Singh Harsumel, D. Patil Shankar, P. Mahesh
and N. Muralitharan
1-D Simulation of a Four Cylinder Direct Injection Supercharged Diesel Engine Equipped with VVT Mechanism  
F2012-A06-039  
Cristian Soimaru, Anghel Chiru and Daniel Buzea  

In-Cylinder Flow Oriented Intake Port Development of Diesel Engine  
F2012-A06-044  
Kang Li, Haie Chen, Wei Li, Huayu Jin and Jiaquan Duan  

The Development of FAW New 3L Diesel Engine  
F2012-A06-045  
Fanchen Meng, Jun Li, Fujian Hou, Wenlie Pi and Qun Chen  

Transient Behavior Study of HD Diesel Engine and the Effects of Turbochargers  
F2012-A06-047  
Yanbin Shi, Guangyong Zheng, Haie Chen and Lei Wang  

Combustion System Development of Direct-Injection Diesel Engine Based on Spatial and Temporal Distribution of Mixture and Temperature  
F2012-A06-048  
Jun Li, Kang Li, Haie Chen, Huayu Jin and Fang Hu  

Part VII  
Heat Transfer and Waste Heat Reutilization  

Numerical Investigation into the Cooling Process of Conventional Engine Oil and Nano-Oil Inside the Piston Gallery  
F2012-A07-002  
Peng Wang, Jizu Lv, Minli Bai, Chengzhi Hu, Liang Zhang and Hao Liu  

Applying Design of Experiments to Develop a Fuel Independent Heat Transfer Model for Spark Ignition Engines  
F2012-A07-004  
Joachim Demuynck, Kam Chana, Michel De Paepe, Louis Sileghem, Jeroen Vancoillie and Sebastian Verhelst
Performance Analysis of a Thermoelectric Generator Through Component in the Loop Simulation
Guangyu Dong, Richard Stobart, Anusha Wijewardane and Jing Li

Analysis and Simulation of Hybrid Electric Turbocharger and Application on ICE and HEV
Feng Tian, Guofeng Ren, Shumei Zhang and Lin Yang

New Compact and Fuel Economy Cooling System “SLIM”
Junichiro Hara, Mitsuru Iwasaki and Yuichi Meguriya

Influence of Operating Parameters on the Thermal Behavior and Energy Balance of an Automotive Diesel Engine
Christian Donn, Daniel Ghebru, Wolfgang Zulehner, Uwe Wagner, Ulrich Spicher and Matthias Honzen

Development of Electric Engine Cooling Water Pump
Atsushi Saito and Motohisa Ishiguro

Yongqiang Han, Zhongchang Liu, Yun Xu and Jing Tian

Study on Exhaust Heat Recovery Utilizing Organic Rankine Cycle for Diesel Engine at Full-load Conditions
Yan Chen, Yanqin Zhang, Hongguang Zhang, Bin Liu, Kai Yang and Jian Zhang

The Impact of Vehicle Heating Systems on the Energy Consumption Determined Based on the Vehicle Exhaust Emission Tests Under Actual Operating Conditions
Jerzy Merkisz, Maciej Bajerlein, Łukasz Rymaniak, Andrzej Ziółkowski and Dariusz Michalak
Part VIII  Emission Standard and International Regulations

Study on a Test Procedure for the NO\textsubscript{x} Emission of Heavy Duty Vehicle................................. 1269
F2012-A08-004
Mengliang Li, Yueyun Xu, Hui Guo, Maodong Fang and Long Sun

Application Research on SCR Post-Processing System in Non-Electronic Diesel Engine of Vehicles ............. 1281
F2012-A08-005
Chenglin Deng, Yingfeng Zhang, Zhengfei Xu and Yan Yu

11L Diesel Engine to Meet China V with Doc ..................... 1291
F2012-A08-007

Part IX  Other

Study the Failure About Spring Which Used on VVA Engine in System......................................................... 1301
F2012-A09-004
Ling Lin, Haizhu He, Jun Mao, Liyun Kang, Maohui Wang, Yang Qiu and Yong He

The Impact of Oil-Based Diamond Nanoﬂuids on Diesel Engine Performance.................................................. 1313
F2012-A09-006
Hao Liu, Minli Bai and Yuan Qu

Citybus Microtrips Classification Using the Data Envelopment Analysis (DEA) Method Applied on Portable Emissions Measurement System (PEMS) Experimental Data ..................... 1321
F2012-A09-007
Jerzy Merkisz, Arkadiusz Barczak and Jacek Pielecha

Extended Charge Motion Design: CAE Based Prediction of Gasoline Engine Pre-ignition Risk ...................... 1333
F2012-A09-009
Jens Ewald, Matthias Budde, Bastian Morcinkowski, Rüdiger Beykirch, Adrien Brassat and Philipp Adomeit
Electric Water-Pump Development for Cooling Gasoline Engine ........................................ 1345
Wenxin Cai, Shenglin Xiong, Lizhi Fang and Shaoping Zha

Two Types of Variable Displacement Oil Pump Development ........ 1357
Dan OuYang, Wenxin Cai, Lei He and Yaojun Li

Considerations on Influencing Factors of Carbon Deposit in Gasoline Direct Injection Engine ....................... 1369
Changhoon Oh

Air Intake Modules with Integrated Indirect Charge Air Coolers ........................................... 1379
Juergen Stehlig, Rene Dingelstadt, Johann Ehrmanntraut, Rolf Mueller and James Taylor