SAE 2014 Energy Saving & Emission Reduction Forum

Technical Session Schedule

As of 11/11/2014 07:41 pm

Wednesday, November 5

Day One

Session Code: ***ESER1***

Room Site N4 Room M46 ***Session Time:*** ***ALL DAY***

Standards for reducing emissions and increasing fuel efficiencies are creating a need for OEMs to develop lighter vehicles to achieve these requirements. This Forum has been designed to provide automobile manufacturers and suppliers the latest advances in manufacturing strategies, design and materials selection strategies to promote lighter weight, higher performing, fuel efficient vehicles without sacrificing safety or performance. It will feature presentations on the latest breakthroughs in lightweight materials and cutting-edge adaptive applications from OEMs, Tier 1 suppliers, universities, and research institutions. Special focus will be on tangible, cost-effective strategies in lightweighting and energy management.

With the increased demands for fuel efficiency and fuel economy, the internal combustion engine (ICE) continues to be examined for design improvements to improve these measures. It is projected that OEMs and suppliers will continue to optimize the ICE at least through 2020. Focusing on the near- and long-term role of the ICE in advanced vehicles and highlighting this accelerating development and calibration; high efficiency combustion and controls; advances in turbo machinery, valve technology or ignition systems; and emission control challenges. Overall, the program may examine several technological advances required to maximize efficiency, including:
¿ Advanced, low-temperature combustion techniques
¿ Improved understanding and modeling of heat loss mechanisms
¿ Electrification and intelligent control of accessory loads
¿ Possible redesign of mechanical systems (e.g., variable stroke for fully expanded cycles)
¿ High-efficiency turbo-machinery to extract exhaust energy and provide boost

Organizers - *Robert M. Wagner, Oak Ridge National Laboratory*

Time	***Paper No.***	***Title***
10:00 a.m.	***ORAL ONLY***	***Keynote***
		Annette G. Hebert, California Air Resources Board
10:30 a.m.	***ORAL ONLY***	***Materials Challenges for a Sustainable Automotive Industry***
		Despite an impressive array of technology advances, the basic operation of the automobile has not changed much over the past 120 years. Vehicles continue to be largely energized by petroleum, powered by internal combustion engines, and controlled via mechanical linkages. However, given society¿s concerns related to energy, environment, safety, congestion, and affordability, one must question whether the continued evolution of traditional automotive technologies will enable sustainable personal mobility. Fortunately, new and more revolutionary automotive technologies are at hand, which will allow the industry to address the issues currently associated with automobiles. These developments include electrification of the propulsion system, advanced electronics and vehicle controls, new telematics and connected vehicle capabilities, lightweight and advanced materials, and energy-efficient, environmentally friendly manufacturing processes.
		Alan I. Taub, University of Michigan
11:30 a.m.	***ORAL ONLY***	***Lightweighting Three***
		TBD, GM

12:00 p.m.	***ORAL ONLY***	***Vehicle Lightweighting from a Commercial Vehicle Wheel Perspective*** *Tightening vehicle emission regulations requires additional technology. New technologies, including aerodynamic aids and emissions control systems, add significant weight to vehicles. Meanwhile freight logistics managers are looking for increased freight efficiency through lighter vehicles to increase payload. This discussion will focus on the benefits of switching to aluminum wheels as an easy-to-implement solution to lower overall vehicle weight and increase freight efficiency with added benefits of improved ride, increased tire wear and lower maintenance cost. In addition, the discussion will cover other light weight aluminum component usage to further lower vehicle weight to achieve emission and fuel efficiency improvement.* *Michael Yagley, Alcoa LLC*
1:30 p.m.	***ORAL ONLY***	***Microtalc Solutions for Lightweighting*** *, Voly Wang Dow*
2:00 p.m.	***ORAL ONLY***	***Potential of a Variable Compression Ratio Gasoline SI Engine with Very High Expansion Ratio and Variable Valve Actuation*** *The scale of China¿s auto industry has been firmly held the first in the world; its volume reached 22 million in 2013 and further growth is predictable as well. While, the constraints to China¿s auto industry are becoming more obvious, among them the energy issue is an especially challenging one to the country. This leads to a stricter CAFC regulation in China--its standard of 5.0L/100km in 2020 is quite hard to be fulfilled. The energy-efficient technologies would thus be one of the core competences for enterprises. In this presentation, the maturity, potential and prospect of technologies, the law-conformance and the consumer-cognition will be discussed in detail.* *Cyrille Constensou, MCE-5 Development*
2:30 p.m.	***ORAL ONLY***	***Perspectives of Energy-Efficient Technologies for China Auto Industry*** *The scale of China¿s auto industry has been firmly held the first in the world; its volume reached 22 million in 2013 and further growth is predictable as well. While, the constraints to China¿s auto industry are becoming more obvious, among them the energy issue is an especially challenging one to the country. This leads to a stricter CAFC regulation in China--its standard of 5.0L/100km in 2020 is quite hard to be fulfilled. The energy-efficient technologies would thus be one of the core competences for enterprises. In this presentation, the maturity, potential and prospect of technologies, the law-conformance and the consumer-cognition will be discussed in detail.* *Fuquan Zhao, Tsinghua Univ.*
3:00 p.m.	***ORAL ONLY***	***Study of Low-Pressure Cooled EGR System for Downsizing Turbocharged Gasoline Engine*** *Recently downsizing turbocharged gasoline engines are dominated into market significantly.* *A low-pressure cooled EGR system has been studied in Nissan to improve fuel econmy for tourbocharged gasoline engine especially in high load condition. This presentation shows the system architecture, fuel economy benefit and control strategies of LP-EGR system.* *Hirofumi Tsuchida, Nissan*
3:30 p.m.		***BREAK***
4:00 p.m.	***Panel***	***High Efficiency Panel Discussion*** ***Moderators -*** *Timothy Johnson, Corning Inc.*

Thursday, November 6

Day Two

Session Code: ***ESER2***

Room Site N4 Room M46 ***Session Time:*** ***ALL DAY***

With the increased demands for fuel efficiency and fuel economy, the internal combustion engine (ICE) continues to be examined for design improvements to improve these measures. It is projected that OEMs and suppliers will continue to optimize the ICE at least through 2020. Focusing on the near- and long-term role of the ICE in advanced vehicles and highlighting this accelerating development and calibration; high efficiency combustion and controls; advances in turbo machinery, valve technology or ignition systems; and emission control challenges. Overall, the program may examine several technological advances required to maximize efficiency, including:
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Emissions, Monitoring, Measurement, Control and Energy Savings Strategies for the Future. Panelists will discuss the current and future Energy Saving strategies based upon the following session topics:
Intelligent Combustion;
Engine Downsizing and Pressure Boosting;
Variable Valve Trains;
Thermal Efficiencies, Including Waste Heat Recovery;
Light, Medium and Heavy Duty Vehicle Content;
Low Voltage Motor and Drives.

Organizers - *Alan I. Taub, University of Michigan*

Time	***Paper No.***	***Title***
10:00 a.m.	***ORAL ONLY***	***Keynote***
		Timothy Johnson, Corning Inc.
10:30 a.m.	***ORAL ONLY***	***B-NOx System as Technical Option to Reduce Urban NOx Emission in Retrofit and First Fit of Diesel Engine Applications***
		Uniform provisions concerning) to the approval of Retrofit Emission Control Devices (REC) and to increasing numbers of cities with clean air programs.
		Wolfgang Frank, Twintec Technologie GmbH
11:00 a.m.	***ORAL ONLY***	***Title TBD***
		Combustion simulations and single cylinder engine tests show a clear potential when coupling the Variable Compression Ratio (VCR) engine with the Variable Valve Actuation (VVA) technologies.
		Sotirios Mamalis, Stony Brook Univ.
11:30 a.m.	***ORAL ONLY***	***Economy with Superior Efficient Combustion (ESTEC)***
		Tetsu Yamada, Toyota Motor Corp.
12:00 p.m.	***ORAL ONLY***	***Title TBD***
		TBD

1:30 p.m.	***ORAL ONLY***	***Future Combustion and Fuel Directions and Opportunities***
		The internal combustion engine will continue to be integral to the transportation of people and goods for the foreseeable future. To reduce environmental impact and improve energy security, many nations are enacting new aggressive fuel economy and emissions standards which are pushing the development of new engine technologies on an unprecedented scale. These new technologies coupled with advances in sensors and onboard computers will enable real-world implementations of new combustion concepts as well as new fuel pathways that blend the best characteristics of spark-ignition and compress-ignition engines for maximum efficiency with lowest possible emissions. Oak Ridge National Laboratory (ORNL) has several ongoing activities exploring the intersection of fuel chemistry and advanced combustion processes including reactivity controlled compression ignition (RCCI) combustion, gasoline partially premixed combustion (PPC), and the use of in-cylinder thermo-chemical reforming (TCR) to compensate fuel-specific differences on the combustion process. The majority of this research is being performed on multi-cylinder engines to ensure the concepts and corresponding efficiency and emissions opportunities are realizable on production viable hardware.
		Robert M. Wagner, Oak Ridge National Laboratory
2:00 p.m.	***ORAL ONLY***	***SwRI's Dedicated EGR : A Cost-Effective Solution for Low CO2 and Beijing 6 Emissions***
		Ian Gilbert, Powertrain Technology, Ltd.
2:30 p.m.	***ORAL ONLY***	***Gasoline Engine Technologies for Passenger Car CO2 Reduction***
		Klaus Denkmayr, AVL LIST GmbH
3:00 p.m.	***ORAL ONLY***	***Update and Technical Challenges on European Emissions Regulations***
		An overview of the European Emissions Regulations is given and the challenges imposed by the more stringent requirements are identified. Emphasis is given on the development of Emissions Regulations starting from Euro 4 and their effects on the automotive industry. Technologies and regulations used and envisaged to reduce CO2 emissions are also discussed together with their trade-offs with pollution reduction measures.
		Zissis C. Samaras, Aristotle University of Thessaloniki
4:00 p.m.	***Panel***	***Lightweighting/Emissions Reduction***
		Moderators - *Zissis C. Samaras, Aristotle University of Thessaloniki*