



Small Engine Technology Conference

2012 SMALL ENGINE TECHNOLOGY CONFERENCE

OCTOBER 16-18, 2012

Monona Terrace
Convention Center
Madison, Wisconsin, USA

Event Guide

Includes Final Program and
Exhibit Directory

www.sae.org/events/setc



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P121816

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ACHIEVING EFFICIENCY

THE ESSENTIAL AUTOMOTIVE TECHNOLOGY EVENT

April 16-18, 2013

Cobo Center ▪ Detroit, Michigan, USA

As we strive to achieve efficiency, the resulting significant and exciting challenges are once again positioning the automobile industry as the industry of choice for the world's best and brightest engineering minds. Vast opportunities await those companies and individuals that dare to be creative and dream big.

Now more than ever, the entire industry must work together to collect and elevate this talent in order to realize responsible mobility and reward those within the engineering community that are good stewards of our natural resources.

Today, efficiency is the new formula for success essential to propel the next generation of automobiles.

sae.org/congress

Host Company



CHRYSLER

Tier One
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EVENT OVERVIEW

Monday October 15	Tuesday October 16	Wednesday October 17	Thursday October 18
Tour registration hours 07.30 - 8:30	Registration hours: 07.30 – 18.30	Registration hours: 07.30 – 17.00	Registration hours: 07.30 – 13.30
Technical tours of John Deere Horicon and Mercury Marine: 08.30 – 16.30	Opening Ceremony and Keynotes: 08.30 – 10.00	Plenary Session: 08.30 – 10.00	Technical Sessions: 08:30 – 10.30
(Note: Buses depart Monona Conference Center at 8.30)	Networking Break: 10.00 – 10.30	Networking Break: 10.00 – 10.30	Networking Break: 10.30 – 11.00
	Sponsored by: 		
	Technical Sessions: 10.30 – 12.00	Technical Sessions: 10.30 – 12.00	Technical Sessions: 11.00 – 12.00
	Lunch: 12.00 – 13.30	Lunch: 12.00 – 13.30	Lunch: 12.00 – 13.30
	Technical Sessions: 13.30 – 15.00	Technical Sessions: 13.30 – 15.00	Closing Ceremony: 13.30 – 14.00 p.m.
	Networking Break: 15.00 – 15.30	Networking Break: 15.00 – 15.30	
	Technical Sessions: 15.30 – 17.30 p.m.	Technical Sessions: 15.30 – 17.00	
Early Bird Registration & Exhibitor Setup 14.00 – 17.00	Welcome Reception: 17.00 – 18.30	Banquet: 18.00 – 20.00	
Exhibition Hours Tuesday 10.00 – 15.30 17.00 – 18.30 Wednesday 10.00 – 15.30 Thursday 10.30 – 13.30		Sponsored by: 	

All times are subject to change

Week at a Glance sponsored by:



Since the first event in 1989, the Small Engine Technology Conference (SETC) continues to be the international technology conference for small engines and related products. SETC is jointly sponsored each year by the Society of Automotive Engineers of Japan, Inc. (JSAE) and SAE International.

SETC History

Conference	City	Country
SETC 1989	Milwaukee	USA
SETC 1991	Yokohama & Hamamatsu	Japan
SETC 1993	Pisa	Italy
SETC 1995	Milwaukee	USA
SETC 1997	Yokohama	Japan
SETC 1999	Madison	USA
SETC 2001	Pisa	Italy
SETC 2002	Kyoto	Japan
SETC 2003	Madison	USA
SETC 2004	Graz	Austria
SETC 2005	Bangkok	Thailand
SETC 2006	San Antonio	USA
SETC 2007	Niigata	Japan
SETC 2008	Milwaukee	USA
SETC 2009	Penang	Malaysia
SETC 2010	Linz	Austria
SETC 2011	Sapporo	Japan
SETC 2012	Madison	USA
SETC 2013	Taipei	Taiwan



FISITA Introduction

FISITA is an independent world body representing over 147,000 automotive engineers belonging to national automotive societies in 38 countries. FISITA was founded in 1948 to provide a global forum for the exchange of technical knowledge on every aspect of vehicle design and manufacture. FISITA brings together engineers and decision-makers from industry, academia and government to work towards the improvement of transportation systems, the conservation of energy and the protection of the environment.

www.fisita.com

SETC General Committee



2012 SETC General Committee Chair – SAE International

James N. Carroll

Principal Engineer
Engine Design and Development
Department

Engine, Emissions and Vehicle Research Division
Office of Automotive Engineering at Southwest Research Institute

Mr. Carroll has extensive experience in emissions testing of both small and large non-road spark-ignited engines, including baseline emissions, emissions durability, and development of emission reduction strategies. He has led projects to develop calibrations for multi-fuel industrial engines, and certify the engines to regulatory standards.

Mr. Carroll has also been involved in baseline emission testing and development of marine engines including personal watercraft, outboard, and inboard and sterndrive engines. He has developed engine calibrations, and catalyst equipped water-cooled exhaust systems to reduce marine engine emissions.

Mr. Carroll has worked with the recreational engine industry to gather in-field operational data from snowmobiles, which was used to develop an emission test cycle. The snowmobile test cycle work led to baseline emissions testing of snowmobiles, and characterization of their particulate emissions.

Mr. Carroll also has experience with transient cycle emissions testing of heavy-duty diesel and alternative fuel engines. His heavy-duty engine projects have included end-of-line testing, durability studies, and prototype engine evaluations. He also has experience with evaluation of natural gas engine catalysts. Jim has published 13 peer-reviewed papers on engine emissions testing and related work.

B.S., Mechanical Engineering, University of Texas at Arlington



2012 SETC General Committee Chair – JSAE

Takashi Mitome

General Manager
Suzuki Motor Corporation

Mr. Takashi Mitome is a General Manager at SUZUKI MOTOR CORPORATION, Motorcycle Product/Engineering Planning dept.

Mr. Mitome graduated from Hokkaido Univ. Japan with Master degree in 1984 for research work on Alcohol Fueled Diesel Engine.

In 1984, he began professional career at SUZUKI. Since then, he has been involved in research and development of mini car engines, emission certification at California USA, World Wide Purchasing together with General Motors and management of SUV plant at Iwata Japan. Then, 2006, he moved to Motorcycle division and started New Motorcycle development such as low fuel consumption engines or fuel cell motorcycles.

From Oct. 2012, he is in charge of Motorcycle Safety & Environment Subcommittee Chair JAPAN AUTOMOBILE MANUFACTURERS ASSOCIATION, Inc.

General Committee Members:

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Glenn Bower, University of Wisconsin
Brian Callahan, Achates Power
James Carroll, Southwest Research Institute
Brent Dohner, Lubrizol
Roy Douglas, Queen's University of Belfast
Ken Fosaaen, Fosaaen Technologies
Jaal Ghandhi, University of Wisconsin-Madison
Peter Kaub, Re-Sol, LLC
Robert Kee, Queen's University of Belfast
Kenneth Kicinski, Harley-Davidson Motor Co.
Joseph Lomonaco, Harley-Davidson Motor Co.
Nagesh Mavinahally, MavinTech LLC.
Geoff McCullough, Queen's University Belfast
Jay S. Meldrum, Michigan Technological University
Scott A. Miers, Michigan Technological University
Daniel Nehmer, John Deere
David Palmer, BRP
Phil Pierce, Harley-Davidson Motor Co.

Paul Richards, Innospec Fuel Specialties
Stephan Schmidt, Technical University of Graz
Kay Stepper, Robert Bosch LLC
Sebastian Strauss, STIHL Inc
Tony Szczotka, Robert Bosch LLC
Dave Thornhill, Queen's University of Belfast

JSAE Members

Takashi Mitome, SUZUKI MOTOR CORPORATION
Sakae Mizumura, Honda R&D Co., Ltd.
Hideyuki Okumura, JBI (Yamaha Motor Co., Ltd.)
Michihisa Nakagawa, Kawasaki Heavy Industries, Ltd.
Tadao Okazaki, LEMA (Kubota Corporation)
Yu Motoyama, Yamaha Motor Co., Ltd.

LEMA Japan Land Engine Manufacturers Association
JBIA Japan Boating Industry Association

SETC Technical Committee



2012 SETC Technical Committee Chair – SAE International

Jaal Ghandhi

Jaal Ghandhi is the Grainger Professor of Sustainable Energy at the University of Wisconsin-Madison, where he is an integral

member of the Engine Research Center. Professor Ghandhi has pioneered the use of laser-based optical diagnostics to study turbulent mixing and combustion in internal combustion engines. He has published widely in the SAE literature and his work has been recognized with the Arch T. Colwell Merit Award (2005), the Small Engine Technology Conference Best Paper Award (2008) and was made an SAE Fellow in 2011. He and his students have made significant contributions to the understanding of stratified spark-ignition combustion, homogeneous compression-ignition combustion, and standard diesel-type combustion. His work has also provided new insights into the small-scale mixing characteristics of the engine flow field. Since 1999 he has been the Director of the Wisconsin Small Engine Consortium, which investigates combustion-related phenomena unique to the operating conditions of small engines. Professor Ghandhi is a member of the SAE and ASME, and is a past Teetor Award recipient as well as the recipient of an NSF CAREER Award. Professor Ghandhi received BS and MS degrees in Mechanical Engineering from the University of Wisconsin-Madison, and a PhD in Mechanical and Aerospace Engineering from Princeton University.



2012 SETC Technical Committee Chair – JSAE

Tomoo Shiozaki

Chief Engineer
Honda R&D Co., Ltd.

Tomoo Shiozaki is a Chief Engineer of Honda R&D Co., Ltd., and currently working at

Planning Division in Motorcycle R&D Center in Japan.

Mr. Shiozaki graduated from the Department of Mechanical Engineering of Yokohama National University in 1982. He joined Honda R&D in 1982 and started his professional career as a designer of engines. Since then he has been engaged in researches and developments of motorcycle engines and transmission technologies.

From 1988 to 2002, Mr. Shiozaki worked for Honda Racing Corporation and pursued the development of the engines used for Grand Prix Road races.

In SETC activities, he has been a member of the Technical Committee since 2007.

Technical Committee Members:

SAE Members

William Attard, MAHLE
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Glenn Bower, University of Wisconsin
Brian Callahan, Achates Power
James Carroll, Southwest Research Institute
Brent Dohner, Lubrizol
Roy Douglas, Queen's University of Belfast
Ken Fosaaen, Fosaaen Technologies
Jaal Ghandhi, University of Wisconsin-Madison
Peter Kaub, Re-Sol, LLC
Robert Kee, Queen's University of Belfast
Kenneth Kicinski, Harley-Davidson Motor Co.
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David Palmer, BRP
Phil Pierce, Harley-Davidson Motor Co.
Paul Richards, Innospec Fuel Specialties
Stephan Schmidt, Technical University of Graz
Kay Stepper, Robert Bosch LLC
Sebastian Strauss, STIHL Inc
Tony Szczotka, Robert Bosch LLC
Dave Thornhill, Queen's University of Belfast

JSAE Members

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Yasuo Moriyoshi, Chiba University
Kihito Kasai, Honda R&D Co., Ltd.
Kenji Nishida, Honda R&D Co., Ltd.
Hideyuki Okumura, JBI (Yamaha Motor Co., Ltd.)
Toshimi Kobayashi, Kawasaki Heavy Industries, Ltd.
Yoshiro Tokunaga, Kawasaki Heavy Industries, Ltd.
Shusuke Okada, LEMA (Yanmar Co., Ltd.)
Tadao Okazaki, LEMA (Kubota Corporation)
Koji Yoshida, Nihon University
Hiromi Deguchi, SUZUKI MOTOR CORPORATION
Yutaka Nitta, SUZUKI MOTOR CORPORATION
Hirofuka Kurita, Yamaha Motor Co., Ltd.
Yasuyuki Muramatsu, Yamaha Motor Co., Ltd.

LEMA Japan Land Engine Manufacturers Association
JBIA Japan Boating Industry Association

GENERAL INFORMATION

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Location

Monona Terrace Community and Convention Center
One John Nolen Drive
Madison, WI 53703
Phone: 608-261-4000
Business Center Fax: 608-261-4049

Hours of Operation

Tour Registration

Monday, October 15
07.30 – 08.30

Conference Registration Lanyards sponsored by:



BOSCH
Invented for life

Monday, October 15
14.00 – 17.00

Tuesday, October 16
07.30 – 18.30

Wednesday, October 17
07.30 – 15.00

Thursday, October 18
07.30 – 13.30

Exhibition

Tuesday, October 16
10.00 – 15.30
17.00 – 18.30

Wednesday, October 17
10.00 – 15.30

Thursday, October 18
10.30 – 13.30

Event Operations Office Room R

Monona Terrace Parking Garage

Rates:

Weekdays: \$1.50 per hour (\$.75 per half hour) \$12.00 daily maximum

Weekends: \$5.00 flat rate

Weekday evenings after 17.00: \$5.00 flat rate

Headquarter Hotel

Hilton Madison Monona Terrace
9 E. Wilson Street
Madison, WI 53703
Phone: 608-255-5100

Emergency Hotline 1-800-581-9295

In the event of an emergency or a major disruption to the schedule of events at the Small Engine Technology Conference, attendees and exhibitors may call this number to receive further information about the resumption of this event. Updates will also be provided via the SAE website at www.sae.org.

GENERAL INFORMATION

Amenities and Restaurants located in the Hilton Madison Monona Terrace

On the shimmering shores of Lake Monona is the heart of downtown and just one block from the State Capitol, this Madison hotel boasts spectacular views of the city and surrounding lakes. Located within walking distance of State Street, including many dining options, art galleries, theatre and other entertainment options; just minutes from the University of Wisconsin Madison Campus.

At the Hilton Madison Monona Terrace, guests enjoy the following:

- 24-hour Business Center
- All new state of the art exercise equipment including Precor Treadmill and Ellipticals (Open 5am-midnight)
- Gift Shop - ATM/24 hours
- Self Check-in lobby kiosk (can print boarding passes)
- Room service 24-hours a day
- Complimentary airport transportation for from Dane County Regional airport 7am - 10pm
- Spacious lobby lounge with a cozy fireplace and overstuffed chairs
- Five private rooms that can be reserved for meetings and dinners
- Indoor pool
- Whirlpool
- Same-day valet service available Monday through Friday
- Concierge staff
- Valet parking (additional fee)
- All guest-rooms overlook Lake Monona or State Capitol

Hotel Dining

- Capitol Chophouse (lunch and dinner)
- OLIVE Breakfast Buffet and Lounge (breakfast and bar menu)

Hilton Madison Monona Terrace Parking

Covered and secure parking is available, managed by CPS.

Self Parking:

\$13.00 per evening

\$3.00 per hour (not to exceed

\$13 per night)

Valet Parking is an additional \$4 service charge per usage.

In/Out Privileges: Available

Parking Information: 6'10" clearance

NETWORKING OPPORTUNITIES

Breaks in the Exhibit Hall

Tuesday, October 16

10.00 – 10.30 Sponsored by:



15.00 – 15.30

Wednesday, October 17

10.00 – 10.30

15.00 – 15.30

Thursday, October 18

10.30 – 11.00

Networking Lunch in the Exhibit Hall

Tuesday, October 16

12.00 – 13.30

Wednesday, October 17

12.00 – 13.30

Thursday, October 18

12.00 – 13.30

Evening Reception Exhibit Hall

Tuesday, October 16

17.00 – 18.30

Banquet Sponsored by:



Wednesday, October 17

18.00 – 20.00

Great Hall

Memorial Union Building

University of Wisconsin

800 Langdon Street

Madison, WI

Shuttle service will be provided from the Main Entrance of Monona Terrace



WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON



Master of Engineering in Engine Systems

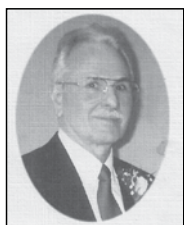
Rated #1 by *U.S. News & World Report* for Online Graduate Engineering Programs

The Master of Engineering in Engine Systems (MEES) program is designed by UW-Madison faculty and industry experts using leading-edge research from the Engine Research Center. You will gain skills you can use immediately, through in-depth courses such as:

- ◆ Analysis of Trends in Engines:
Legislative Drivers and Alternative Fuels
- ◆ Engine Design
- ◆ Engine Performance and Combustion
- ◆ Engine Systems and Control

mees.engr.wisc.edu/2012smallengine

IN REMEMBRANCE



Dr. Benjamin L. Sheaffer

Dr. Benjamin Long Sheaffer, 82, passed away unexpectedly on September 10, 2012 in Beaufort, South Carolina.

Ben graduated from Purdue University with a B.S., an M.S., and a Ph.D. in engineering. He worked at McCulloch on two-stroke engines for helicopters, autogyros and unmanned aircraft. Later he worked at Mercury Marine for over thirty years, where he was awarded twenty-one patents. He led development on many new things including rotary engines, chrome bores, fuel injection, and cracked-cap connecting rod design. He was working at XRD in Beaufort, South Carolina at the time of his death.

He was a longtime member of the SAE. He was elected fellow in 1991 and also twice received the Forest R. McFarland award for organizing technical sessions of what evolved into the SETC.

Ben was a very private and understated man. His latest resume, which took but half a page, listed "forty-five years' experience in the design and development of two-stroke engines". As one colleague remarked, that is, of course, worth ninety years of four-stroke experience.

Ben made significant technical contributions to the engine community but was also a true student of his craft. He was like a walking encyclopedia and quick to share his knowledge to the benefit of all. His approachable personality combined with his generosity created a life-long impression on everyone he worked with. He will be truly missed by many friends and relatives.



Mr. Kazuyuki Shiomi

Mr. Shiomi died an early death on July 31 at the age of 55. Graduating from Tokyo Institute of Technology with BS degree, he joined Honda R&D in 1985. He began his professional career in the research and development of engines and power products using CAE technologies & testing, and later engaged in the development of various power products such as generators, Micro Combined Heat & Power systems, snow blowers, lawn & garden equipment and outboard motors.

In 2006, he became a member of JSAE SETC technical committee and took a role of Technical Committee Chair in SETC2008. He actively contributed for strengthening collaborative relationship in SETC activities between JSAE and SAE.

Mr. Shiomi will be dearly missed by SETC committee members, many colleagues and friends.

At the forefront of ground vehicle standards development. Then and now.

The first engine oil viscosity standard and the introduction of engine horsepower ratings. The influence of motorcycle headlamps and rollover protective structures for tractors. A standard that defines electric-vehicle charging couplers and the creation of those to aid in the development of the Smart Grid.

For over 100 years, SAE International has played a critical role in the progress of the automobile and the ground vehicle industry.

And while the work of engineering today's vehicles may on the surface look very different given the complexity of technology and global markets, SAE International and its standards development program have essentially remained unchanged. It continues to provide a neutral forum for collaboration on common engineering

challenges and the creation of standards, thereby helping industry reduce costs, increase productivity, improve market position, and advance new technologies.

Whether it is bringing standards for and from the United States market to the global table or serving as the world's center of expertise on Commercial Vehicle/ConAg standards, SAE International is uniquely positioned to provide innovative standards solutions—be they by consensus, consortia or harmonization—that offer industry, companies, and individuals opportunities to influence, grow, and prosper.

Join the important work of SAE Technical Standards Development

Currently there is a heightened need for experts in the following areas:

- Electrical Systems
- Materials, Parts & Processes
- Vehicle Safety Systems
- Powertrain Systems/Battery Standardization



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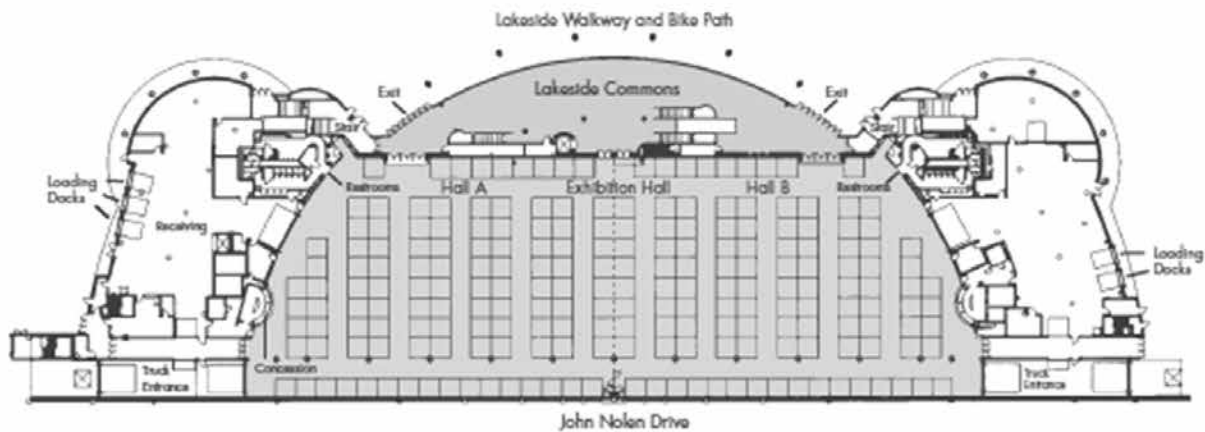
SAE International

"The society dedicated to advancing mobility engineering worldwide"

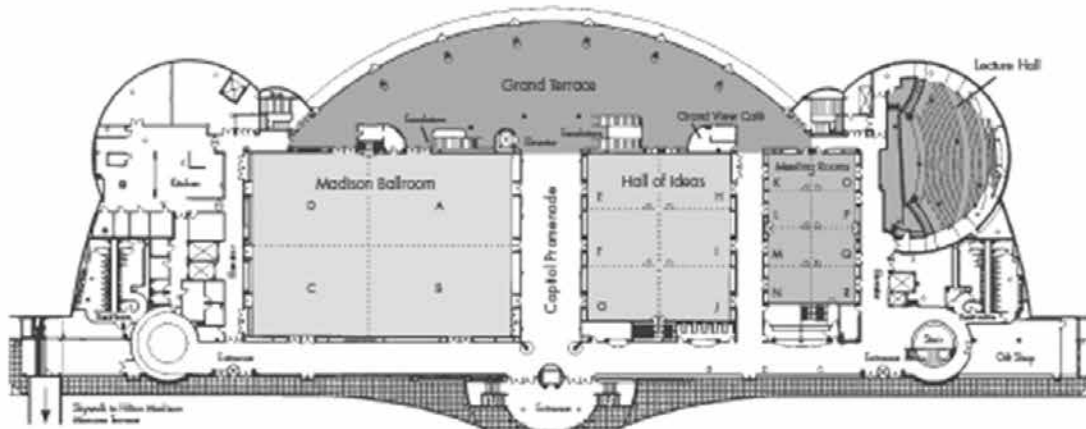
Automotive Headquarters
1.248.273.2455
www.sae.org

Monona Terrace Community and Convention Center floor plan

LEVEL 1 - LAKESIDE



LEVEL 4 - MEETING ROOMS / GRAND TERRACE



Things to do in Madison

Go to the Madison Convention and Visitors Bureau website at <http://www.visitmadison.com/> to learn about everything from shopping, dining, sporting events, arts, culture and MORE!

SPECIAL EVENTS AND NETWORKING OPPORTUNITIES

MONDAY
15 October

Technical tours of John Deere and Mercury Marine

**Pre-Registration Required*

***No cameras or cell phones will be permitted.*

One tour...two locations!

You get a two-for-one deal when you participate in this technical tour, visiting John Deere and Mercury Marine.

07.30 – 08.30

Tour Registration – Monona Terrace Convention Center, Madison, WI
Buses depart Monona Terrace Convention Center at 8.30

Tour fee is \$50 per person. Please visit registration desk for availability.



Emergency Hotline

1-724-772-4044

SAE International

World Headquarters

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Warrendale, PA 15096-0001 USA
Phone: 1-724-776-4841
Fax: 1-724-776-0790

Customer Service

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Automotive Headquarters

755 W. Big Beaver Rd.
Troy, MI 48084
Phone: 1-248-273-2455
Fax: 1-248-273-2494



TUESDAY
16 October

Opening Ceremony and Keynote Address

08.30 – 10.00



Welcoming Remarks – SAE

James N. Carroll

Principal Engineer
Engine Design and Development Department
Engine, Emissions and Vehicle Research Division
Office of Automotive Engineering
Southwest Research Institute
(see biography on p. 5)



Welcoming Remarks – JSAE

Norimasa Iida

Professor, Department of System Design Engineering
Faculty of Science and Technology, Keio University Japan

CURRICULUM VITAE:

Norimasa Iida is a Professor in the Faculty of Science and Technology at Keio University, Japan. He obtained his PhD in 1983 from Keio University on the topics of propagation and extinction mechanisms of premixed flames flowing into a narrow channel from a combustible-

gas-charged chamber, from where he started his career.

Norimasa Iida spent a very productive year as a Visiting Assistant Professor working at the Engine Research Center, University of Wisconsin-Madison, USA.

He headed a project "Low Heat Rejection Ceramics Two-stroke Methanol Engine" at Kanagawa Academy of Science and Technology in Japan.

Norimasa Iida has contributed his research work in the combustion and emission of internal combustion engines with his special interests in life cycle assessment for next generation vehicles. He, as a leader in HCCI combustion research, has published more than 100 papers on the subject, most of which are presented at SAE International, JSAE and JSME.

Norimasa Iida is currently serving as Vice Chair of JSAE Technology Board.

- 1973 Graduated from Department of Mechanical Engineering, Faculty of Engineering, Keio University, Japan
- 1980 Earned Doctor of Engineering at Keio University
- 1983 Became Assistant, Faculty of Science and Technology, Keio University
- 1985 Became Assistant Professor, Faculty of Science and Technology, Keio University
Was appointed Visiting Professor in Mechanical Engineering Department, University of Wisconsin, Madison, USA
- 1990 Headed Ceramics Methanol Engine Project, Kanagawa Academy of Science and Technology, Japan
- 1991 Became Associate Professor, Faculty of Science and Technology, Keio University
- 1997 Became Professor, Faculty of Science and Technology, Keio University

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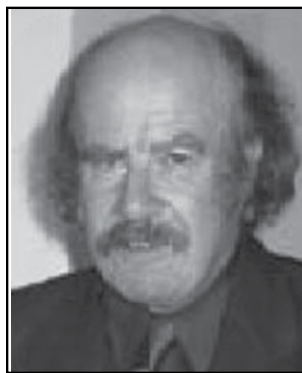
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TUESDAY
16 October

Keynote Addresses

08.30-10.00



Professor Harry Watson

University of Melbourne

Prof. Harry Watson's vision and research leadership at the University of Melbourne have made outstanding contributions to engine development for which he was awarded 2010 FISITA Gold Medal. His contributions have been based on the chemistry and physics of internal combustion engine processes. Practical experience in building petrol and gas turbine engines led to a PhD on reaction kinetics for hydrogen combustion in engines and thus understanding, for the first time, of the role of

chemistry in the HCCI engine process and jet assisted ignition (GAI). This founded lifelong development of computer models for engine efficiency and emissions and building world leading natural gas and hydrogen engines. A long the way he has designed many small engines both two stroke and four stroke, ultra high speed (Formula One research) and high speed optical access engines. In the middle 80's his work with GM and Garrett demonstrated up to 40% fuel economy improvement from down-sizing with turbocharging that included testing the first ceramic turbines. In a Ford alternative fuel project the first application of Bosch's natural gas injectors led to production engines with 45% CO₂ reduction from gasoline baseline, using CR 16 optimised combustion chambers and ultra lean burn. Based on these and other experiences the keynote will examine the challenges of small engine development, including heat transfer, the interaction of valve events and boosting, lean burn, low speed efficiency, knock and high specific output, touching on control and mechanical design issues.

Professor Watson is a member of the FISITA Council, President of SAE-Australasia 2002-2006 and Head of Mechanical Engineering at UniMelb 1996-2000 and a Fellow of the Australian Academy for Science and Engineering.

Keynote Addresses Continued



Mr. Tetsuo Suzuki

Senior Managing Officer and Director,
Chief Operating Officer, Motorcycle R&D Center,
Honda R&D Co., Ltd.
President, Honda Racing Corporation

Small Engines are Not Small!

TUESDAY

16 October

Professional Experience

- 1983 Joined Honda Motor Co., Ltd.
 Transfer to Asaka R&D Center, Honda R&D Co., Ltd.
- 2001 Manager, Motor Sports Development, Asaka R&D Center, Honda R&D Co., Ltd.
- 2006 Operating Officer, Motorcycle R&D Center, Honda R&D Co., Ltd.
- 2008 Managing Officer, Motorcycle R&D Center, Honda R&D Co., Ltd.
- 2009 Managing Officer, Chief Operating Officer, Motorcycle R&D Center,
 Honda R&D Co., Ltd.
 President, Honda Racing Corporation
- 2011 Managing Officer and Director, Chief Operating Officer, Motorcycle R&D Center,
 Honda R&D Co., Ltd.
 President, Honda Racing Corporation
- 2012 Current position

Networking Lunch in Exhibit Hall

12.00 – 13.30

Networking Reception in Exhibit Hall

17.00 – 18.30

WEDNESDAY

17 October

Plenary Panel Discussion

The Art and Science of Small Engine Design & Applications

08.30 – 10.00

Moderator:

Jaal Ghandhi, Grainger Professor of Sustainable Energy, University of Wisconsin-Madison

Wolfgang Wukisiewitsch, Vice President R&D, Managing Director Powertrain Division, BRP Powertrain GmbH & Co

Hugh Blaxill, General Manager, MAHLE

Kirk Rasmussen, Manager of Styling, Harley-Davidson Motor Company



Wolfgang Wukisiewitsch

Vice President R&D, Managing Director Powertrain Division, BRP Powertrain GmbH & Co KG

Innovation - Art and Science of Engineering

1982 – 1990 study of electric/electronics TU Graz

1991 – 1993 Development Engineer for electronic controlled Diesel injection systems, BMW Motors, Steyr

1994 – 1998 Project Leader, Diesel engines, BMW Motors, Steyr

1998 – 2000 Segment Leader, AVL Graz

2000 – 2001 Project Leader, 4 cylinder VALVETRONIC gasoline engines, BMW AG Munich

2001 – 2002 Team Leader, sequential gearbox, BMW AG, Munich

2003 – 2004 Chief engineer 4 cylinder gasoline engines, BMW AG

2004 – 2006 Manager, engine electrical systems gasoline engines, BMW AG, Munich

2007 - 2008 Vice President Product Development, Managing Director BRP-Rotax GmbH & Co. KG

Since 2009 Vice President R&D, Managing Director

Powertrain Division, BRP-Powertrain GmbH & Co KG

Plenary Panel Continued



Hugh Blaxill

General Manager
MAHLE

Hugh Blaxill has been the Managing Director at MAHLE Powertrain LLC in Novi, Michigan since September 2010. With 19 years in the engineering field, 8.5 being Chief Engineer, Hugh holds an extensive amount of technical and management experience. He received his Mechanical Engineering Degree, BSc, from the University of Bath, UK, and completed a Masters of Philosophy in Mechanical Engineering specializing in Novel Engine Design and Development. Hugh has been an international key note

speaker on performance, emissions and downsizing engines for multiple conferences across the globe. He is active in many automotive committees such as NIAGT, IMechE, LowCvP and Foresight Vehicle, and has been on a variety of panels and organizing committees. Hugh has patents and patent applications in the use of the combination of internal and external EGR in controlled auto-ignition engines and the application of Cam-in-Cam to a DOHC valvetrain layout. Since 1999 he has authored and co-authored 20 plus SAE and Non-SAE technical papers on the subject of internal combustion engines, in particular in areas of fluid flow and combustion.

WEDNESDAY

17 October

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P121525

WEDNESDAY

17 October

Plenary Panel Continued



Kirk Rasmussen

Manager, Styling
Harley-Davidson

Biography:

Kirk Rasmussen has been a designer of planes, trains and automobiles... and for the last 17 years the world's greatest motorcycles. His education and background are in Industrial Design and Manufacturing Engineering. He earned a Bachelor's of Fine Arts and a Master of Science from Brigham Young University. Kirk has enjoyed his design roles

with a diverse set of experiences including working with Chrysler, Bell Helicopter, General Dynamics, Cal Trans, Amtrak & Alcoa/Fibertek and Harley-Davidson. Kirk's passion is motorcycle industrial design. "I have a love of art and balance found in nature; and respect the ingenuity of mankind."

Experience:

Manager Styling Harley-Davidson 2005-2012

- Industrial Design Lead: NHRA V-Rod® Drag Racer, Custom Vehicle Operations™ (CVO™) V-Rod Destroyer®, "VRSC" VRSCX®, Softail® Deluxe, Softail Custom®, Harley-Davidson® Cross Bones®, Fat Boy®, Softail FLSTC®, V-Rod Muscle®, several additional CVO models and the list continues.

- 9 Patents, member of the Patent Review Committee, Product Development Process Leadership

Senior Industrial Designer/Styling Harley-Davidson 1995-2005

- Helped establish CAID Styling & Surfacing Principles for Product Development. Created some of the first virtual, photo-real, full motorcycles in the industry.

Design Manager Intermountain Design Inc. 1992-1995

- Cal-Trans Train Industrial Design Manager

Senior Designer, Exhibit Center, 1991-1992

Design Department Instructor, BYU 1992

Engineer/Design, General Dynamics 1986-1991

- Design support of F-16 Derivatives

Industrial Designer, Richard Ten Eyck Associates 1983-1986

- Conceptual design of Bell Helicopter Derivatives 206L, 222, 214, V-22 Osprey

- MonArk & Mastercraft Boats

Industrial Design Intern, Chrysler 1982

Education:

Master of Science. Computer Integrated Manufacturing Engineering, BYU 1998

Bachelor of Fine Art. Industrial Design, BYU 1983

Networking Lunch in Exhibit Hall

12.00 – 13.30

WEDNESDAY

29 September

SETC 2012 Banquet

18.00 – 20.00

Great Hall
Memorial Union Building
The University of Wisconsin
800 Langdon Street
Madison, WI 53706

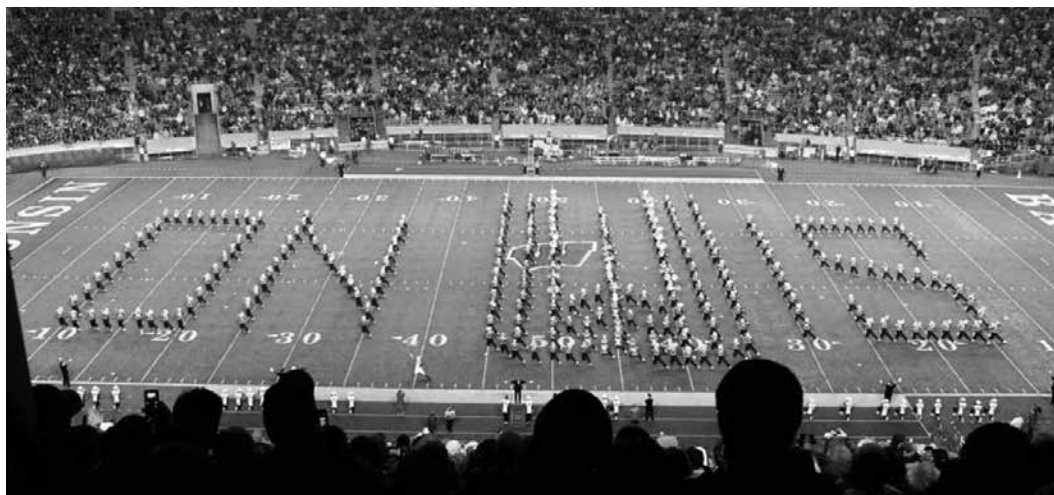


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SPECIAL EVENTS AND NETWORKING OPPORTUNITIES

THURSDAY
18 October

Networking Lunch in Exhibit Hall

12.00 – 13.30

Closing Ceremony

13.30 – 14.00

Introductory Remarks:

Jim Carroll, SAE International General Committee Chair

Best Paper and Best Presentation Awards:

Jaal Ghandhi, SAE International Technical Committee Chair

Tomoo Shiozaki, JSAE Technical Committee Chair

SETC 2013 Announcement:

Mr. Wang Han-Ying (ITRI: Industrial Technology Research Institute)
and Professor Liu Tyng (National Taiwan University)

Mr. Andie Lee of China Motor Corporation

"Don't judge each day by the harvest you reap, but by the seeds you plant."

Robert Louis Stevenson

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P90640

SESSIONS AT-A-GLANCE

	AM	PM	Room No.	Page No.
Tuesday October 16				
Advanced Combustion (Part 1 of 3) (SETC101)	✓		Hall of Ideas I	22
Advanced Combustion (Part 2 of 3) (SETC101)		✓	Hall of Ideas I	23
Alternative Fuels (Part 1, 2 of 5) (SETC102)	✓	✓	Hall of Ideas H	22, 24
Diesel Engines (Part 1 of 2) (SETC106)	-	✓	Hall of Ideas H	25
Engine Controls (Part 1 of 3) (SETC109)	-	✓	Rooms MQ	26
Engine Technology (Part 1, 2, 3 of 5) (SETC110)	✓	✓	Rooms LP	22, 24, 26
Engine and Vehicle Components (SETC108)	✓	-	Rooms KO	23
Fuel Supply Systems (SETC112)	✓	-	Rooms MQ	23
HCCI (Part 1 of 2) (SETC113)	-	✓	Hall of Ideas I	26
Materials (Part 1 of 2) (SETC116)	-	✓	Rooms MQ	24
Measurement and Simulation (Part 1 of 3) (SETC117)	-	✓	Rooms KO	27
Two-Stroke Engines (Part 1 of 4) (SETC120)	-	✓	Rooms KO	25
Wednesday October 17				
Alternative Fuels (Part 3 of 5) (SETC102)	✓		Hall of Ideas H	28
Alternative Fuels (Part 4, 5 of 5) (SETC102)		✓	Hall of Ideas H	30, 31
Collegiate Events (SETC103)	-	✓	Rooms MQ	32
Diesel Engines (Part 2 of 2) (SETC106)	-	✓	Rooms LP	32
Engine Controls (Part 2 of 3) (SETC109)	-	✓	Rooms KO	30
Engine Technology (Part 4 of 5) (SETC110)	✓	-	Rooms LP	28
Engine Technology (Part 5 of 5) (SETC110)	-	✓	Rooms LP	30
HCCI (Part 2 of 2) (SETC113)	-	✓	Rooms MQ	31
Hybrid, Electric Drive, and Fuel Cell (Part 1 of 2) (SETC114)	✓	-	Rooms KO	28
Hybrid, Electric Drive, and Fuel Cell (Part 2 of 2) (SETC114)	-	✓	Rooms KO	32
Measurement and Simulation (Part 2 of 3) (SETC117)	✓	-	Rooms MQ	29
Two-Stroke Engines (Part 2 of 4) (SETC120)	✓	-	Hall of Ideas I	29
Two-Stroke Engines (Part 3, 4 of 4) (SETC120)	-	✓	Hall of Ideas I	31, 33
Thursday October 18				
Advanced Combustion (Part 3 of 3) (SETC101)	✓	-	Rooms LP	36
Emissions and Environmental Impacts (SETC107)	✓	-	Rooms MQ	34
Engine Controls (Part 3 of 3) (SETC109)	✓	-	Hall of Ideas I	34
Lubricants (SETC115)	✓	-	Rooms MQ	36
Materials (Part 2 of 2) (SETC116)	✓	-	Rooms LP	34
Measurement and Simulation (Part 3 of 3) (SETC117)	✓	-	Rooms KO	35
NVH Technology (SETC118)	✓	-	Hall of Ideas H	35
Vehicle Dynamics (SETC121)	✓	-	Rooms KO	36

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Tuesday
October 16

Advanced Combustion (Part 1 of 3) (SETC101)

10:30

Room - Hall of Ideas I

This session focuses on advanced combustion technologies in both 4-stroke and 2-stroke engines. The scope of topics includes studies of mixture formation, dilution effects, ignition, abnormal combustion, engine efficiency, flame propagation, and emissions formation.

Organizers:

William P. Attard, MAHLE Powertrain LLC; Yasuo Moriyoshi, Chiba Univ.; Kenji Nishida, Honda R&D Co., Ltd.

Chairpersons:

William P. Attard, MAHLE Powertrain LLC; Kenji Nishida, Honda R&D Co., Ltd.

10:30 (2012-32-0001/20129001)

The Influence of Hot Gas Jet on Combustion Enhancement for Lean Mixture in Plasma Jet Ignition

Ryo Sasaki, Akira Iijima, Hideo Shoji, Koji Yoshida, Nihon University

11:00 (2012-32-0008/20129008)

The Research about Engine Optimization and Emission Characteristic of Dual Fuel Engine Fueled with Natural Gas and Diesel

Ocktaeck Lim, University of Ulsan; Norimasa Iida, Keio University; Gyubaek Cho, Korea Institute of Machinery & Materials; Jamsran Narankhuu

11:30 (2012-32-0007/20129007)

A Comparison of Engine Knock Metrics

Arsham J. Shahdari, Jaal B. Ghandhi, Univ of Wisconsin Madison

Planned by SETC General Committee / EMB Land and Sea Group

Alternative Fuels (Part 1 of 5) (SETC102)

10:30

Room - Hall of Ideas H

This session invites paper focused on aspects of operating small engines on non-petroleum based fuels or non-conventional blends of fuels. This includes performance metrics such as power, efficiency and emissions. It also covers durability considerations including materials compatibility, wear rates, etc. These three particular papers focus on the use of biodiesel.

Organizers:

Shusuke Okada, Yanmar Co., Ltd.; Paul Richards; Koji Yoshida, Nihon University

Chairpersons:

Shusuke Okada, Yanmar Co., Ltd.; David A. Rothamer, Univ. of Wisconsin

10:30 (2012-32-0009/20129009)

Comparison of ULSD, Used Cooking Oil Biodiesel, and JP-8 Performance and Emissions in a Single-Cylinder Compression-Ignition Engine

Michael Mangus, Christopher Depcik, University of Kansas

11:00 (2012-32-0010/20129010)

A Study on the Compression Ignition Characteristics of FAME for Low Compression Ratio Diesel Engine

Yuya Abe, Akira Iijima, Hideo Shoji, Koji Yoshida, Nihon Univ

11:30 (2012-32-0025/20129025)

Impact of CNT Blended Biodiesel Emulsion Fuel in a Diesel Engine: An Experimental Investigation

J. Sathik Basha, R.B. Anand, NIT, Tiruchirappalli, INDIA

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00305, and also individually. To purchase visit collections.sae.org

Engine Technology (Part 1 of 5) (SETC110)

10:30

Room - Rooms LP

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation.

Organizers:

Dr. Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

Chairpersons:

Nagesh Mavinahally, MavinTech. LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

10:30 (2012-32-0055/20129055)

Improvement of Performance of Single Cylinder Motorcycle Engine by Optimizing the Port Flow Coefficients Through Integrated 1D/3D-CFD Analysis

Balasankar Pinnapedda, Anish Gokhale, Mahindra 2 Wheelers Ltd.

11:00 (2012-32-0065/20129065)

Evaluation of the Effects of Combustion by Multi-Ignition in Natural Gas Engines

Yoshitane Takashima, Hiroki Tanaka, Takahiro Sako, Osaka Gas Co.,Ltd.

11:30 (2012-32-0069/20129069)

Layout of a Charged Power Sport Engine

Christian Zinner, Reinhard Stelzl, Stephan Schmidt, Graz University of Technology; Stefan Leiber, Thomas Schabetsberger, BRP-Powertrain GmbH & Co KG

Planned by SETC General Committee / EMB Land and Sea Group

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Engine and Vehicle Components

(SETC108)

10:30

Room - Rooms KO

Organizers:

Toshimi Kobayashi, Kawasaki Heavy Industries, Ltd.; David James Thornhill, Queen's Univ. of Belfast

Chairpersons:

Robert Kee, Queen's University Belfast; Toshimi Kobayashi, Kawasaki Heavy Industries, Ltd.

10:30 (2012-32-0040/20129040)

Optimization of an Automotive Grade Stepper Motor Idle Air Control Valve for the Small Engine Market

Craig Weldon, Continental Tire Canada Inc.; Dian Hong, Kun Chen, Continental Automotive Wuhu; Jie Ren, Jean Fanielle, Alois Christiaens, Continental Automotive Belgium N.V

11:00 (2012-32-0042/20129042)

Assessment of Durability of Needle Roller Bearing on Crankshaft of Internal Combustion Engine on Basis of Slip Ratio

Takao Kudo, Honda R&D Co.,Ltd. Motorcycle R&D Center

Planned by SETC General Committee / EMB Land and Sea Group

Fuel Supply Systems (SETC112)

10:30

Room - Rooms MQ

Organizers:

Takashi Mitome, Suzuki Motor Corp.; Daniel Nehmer, BRP US Inc.

Chairpersons:

Takashi Mitome, Suzuki Motor Corp.; Daniel Nehmer, John Deere & Co.

10:30 (2012-32-0071/20129071)

Improvement of Spray Characteristics in Port Injectors

Junichi Nakamura, Akira Akabane, Koji Kitamura, Yuzuru Sasaki, Keihin Corp.

11:00 (2012-32-0072/20129072)

Numerical Study on the Hydrogen Fueled SI Engine Combustion Optimization through a Combined Operation of DI and PFI Strategies

Medhat Elkelawy, Huazhong University of Science & Techno.

11:30 (2012-32-0073/20129073)

Study on Strategies of Anti-Wear and Leakage for Fuel Injection System of Dimethyl Ether (DME) Engine

Guangde Zhang, Wuhan University of Science & Technology; Caixia You; Weihua Wang; Lu Xie; Jing Sun

Planned by SETC General Committee / EMB Land and Sea Group

Advanced Combustion (Part 2 of 3) (SETC101)

13:30

Room - Hall of Ideas I

This session focuses on advanced combustion technologies in both 4-stroke and 2-stroke engines. The scope of topics includes studies of mixture formation, dilution effects, ignition, abnormal combustion, engine efficiency, flame propagation, and emissions formation.

Organizers:

William P. Attard, MAHLE Powertrain LLC; Yasuo Moriyoshi, Chiba Univ.; Kenji Nishida, Honda R&D Co., Ltd.

Chairpersons:

William P. Attard, MAHLE Powertrain LLC; Akihito Kasai, Honda R&D Co., Ltd.

13:30 (2012-32-0003)

A Simple Model of Cyclic Variation

Kenneth Seonguk Kim, Jaal Ghandhi, Univ of Wisconsin Madison

14:00 (2012-32-0006/20129006)

Controlled Hot Surface Ignition in Stationary Petrol and Natural Gas Operation

Denis Neher, Fino Scholl, Victor Teschendorff, Maurice Kettner, Karlsruhe University of Applied Sciences; Philipp Huegel, Heiko Kubach, Karlsruhe Institute Of Technology; Markus Klaissle, Senertec Kraft-Wärme-Energiesysteme GmbH; Blanca Giménez Olavarria, University of Valladolid

Tuesday October 16

14:30 (2012-32-0004/20129004)

Preliminary Results from a Simplified Approach to Modeling the Distribution of Engine Knock

Kenneth Seonguk Kim, Jaal Ghandhi, Univ of Wisconsin Madison

Planned by SETC General Committee / EMB Land and Sea Group

Alternative Fuels (Part 2 of 5) (SETC102)

13:30

Room - Hall of Ideas H

This session invites paper focused on aspects of operating small engines on non-petroleum based fuels or non-conventional blends of fuels. This includes performance metrics such as power, efficiency and emissions. It also covers durability considerations including materials compatibility, wear rates, etc. These two particular papers focus on the use of alcohol in compression ignition engines.

Organizers:

Shusuke Okada, Yanmar Co., Ltd.; Paul Richards; Koji Yoshida, Nihon University

Chairpersons:

Roland Kirchberger, Graz University of Technology; Koji Yoshida, Nihon University

13:30 (2012-32-0011/20129011)

In-Use Performance Testing of Butanol-Extended Fuel in Recreational Marine Engines and Vessels

Jeff R. Wasil, BRP US Inc.; John McKnight, National Marine Manufacturers Assoc; Richard Kolb, Volvo Penta of the Americas; Dave Munz, Gevo Inc; John Adey, Brian Goodwin, American Boat & Yacht Council Inc

14:00 (2012-32-0018/20129018)

Fuel Spray Evaporation and Mixture Formation Processes of Ethanol/Gasoline Blend Injected by Hole-Type Nozzle for DISI Engine

Masaharu Chato, University of Hiroshima; Suguru Fukuda, Honda Motor Co.; Kiyotaka Sato, Tatsuya Fujikawa, Mazda Motor Co.; Run Chen, Zezheng Li, Jiangping Tian, Keiya Nishida, University of Hiroshima

14:30 (2012-32-0023/20129023)

Performance and Emissions Characteristics of an E85 Retrofitted Baja SAE Vehicle

Scott Curran, Oak Ridge National Laboratory; David Irick, William Rohr, The University of Tennessee

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00305, and also individually. To purchase visit collections.sae.org

Engine Technology (Part 2 of 5) (SETC110)

13:30

Room - Rooms LP

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation.

Organizers:

Dr. Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

Chairpersons:

James Newton Carroll, Southwest Research Institute; Hideyuki Okumura, Yamaha Motor Co., Ltd.

13:30 (2012-32-0058/20129058)

Development of Electromagnetic Valve in ICE

Akihito Okazaki, Nippon Institute of Technology

14:00 (2012-32-0056/20129056)

Plasma Coating to Replace Cast Iron Cylinder Liners in Production

Thomas Zorn, Gunter Nentwich, Anton Pichler, BRP-Powertrain GmbH & Co. KG

14:30 (2012-32-0061/20129061)

A Study for Generating Power on Operating Parameters of Powerpack Utilizing Linear Engine

Yongil Oh, Ocktaeck Lim, University of Ulsan; Gangchul Kim, Korea Institute of Energy Research; Norimasa Iida, Keio University

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Materials (Part 1 of 2) (SETC116)

13:30

Room - Rooms MQ

This session will focus on the structure, processing, and properties of materials in small engine applications. Some possible topics include lightweighting of engine and vehicle components; heat treatment and surface processing; fatigue, fracture, and wear; coatings; and advanced ceramic, metallic, and polymeric materials.

Organizers:

Hiroataka Kurita, Yamaha Motor Co., Ltd.; David Palmer, BRP US Inc.

Chairpersons:

Hiroataka Kurita, Yamaha Motor Co., Ltd.; David Elijah Palmer, BRP US Inc.

13:30 (2012-32-0088/20129088)

Development of Lightweight DLC Coated Valve Lifter Made from Beta Titanium Alloy for Motorcycles

Kosuke Doi, Hirotaka Kurita, Yamaha Motor Co., Ltd

14:00 (2012-32-0091/20129091)

Nickalyn - High Strength Aluminum Alloys of a New Generation

Nikolay Belov, Inventor

14:30 (2012-32-0094/20129094)

Lightening Approach for Small Vehicles by Developing Extruded Aluminum Suspension Arm

Gouki Yotsuya, Ryo Yamauchi, Suzuki Motor Corporation

Planned by SETC General Committee / EMB Land and Sea Group

Two-Stroke Engines (Part 1 of 4) (SETC120)

13:30

Room - Rooms KO

This session contains manuscripts focused on two-stroke engines. Topics such as emissions, performance, and efficiency will be explored. Advanced combustion control, direct fuel injection, simulation models and experimental results will be presented.

Organizers:

Scott A. Miers, Michigan Technological University; Kazuyuki Shiomi, Honda R&D Co., Ltd.

Chairpersons:

Tyng Liu, National Taiwan University; Scott A. Miers, Michigan Technological Univ.

13:30 (2012-32-0119/20129119)

Multi-Layer Stratified (MuLS) Two-Stroke Engine

Nagesh Mavinahally, MavinTech. LLC.; Jay Veerathappa; Sharu Rajgiri, SCR, Inc.; Vinayaka Mavinahalli, Reckon Tech India

14:00 (2012-32-0114/20129114)

Numerical and Experimental Investigation of In-Cylinder Flow in a Loop-Scavenged Two-Stroke Free Piston Engine

Johannes Haag, Cornelius Ferrari, Jan Hendrik Starcke, Michael Stöhr, Uwe Riedel, German Aerospace Center (DLR)

14:30 (2012-32-0116/20129116)

Development of a Compact Intake Porting Design for a 2-Stroke DI Outboard Engine

Paul Westhoff, Justin Johnson, BRP US Inc.

Planned by SETC General Committee / EMB Land and Sea Group

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Diesel Engines (Part 1 of 2) (SETC106)

15:30

Room - Hall of Ideas H

Papers in this session will pertain to studies of naturally aspirated and boosted diesel engines including their design, emission control, NVH, fuel system, fuel type, aftertreatment, combustion quality, or engine control.

Organizers:

Daniel Nehmer, John Deere & Co.; Yoshiro Tokunaga, Kawasaki Heavy Industries, Ltd.

Chairpersons:

Daniel Nehmer, John Deere & Co.; Yoshiro Tokunaga, Kawasaki Heavy Industries, Ltd.

15:30 (2012-32-0034/20129034)

Effect of Hydrogen Induction on Combustion Characteristics of a Dual Fuel Engine Fuelled with Diesel and Hydrogen

Senthil Kumar Masimalai, Madras Institute of Technology

16:00 (2012-32-0032/20129032)

Study of the Characteristic of Diesel Spray Combustion and Soot Formation Using Laser-Induced Incandescence (LII)

Xiaobei Cheng, Liang Chen, Fangqin Yan, Huazhong University of Science and Tech.

16:30 (2012-32-0029/20129029)

Influence of Actual Injector Tip on Multi-Hole Diesel Nozzle Flow

Giancarlo Chiatti, Fulvio Palmieri, Università degli Studi Roma TRE

17:00 (2012-32-0033/20129033)

JAECFD Simulation Analysis of Cavitating Flow in a Real Size Diesel Engine Injector Nozzle

Hagar Alm El-Din Bastawissi; Medhat Elkelawy, Tanta University

Planned by SETC General Committee / EMB Land and Sea Group

Tuesday
October 16

Engine Controls (Part 1 of 3) (SETC109)

15:30

Room - Rooms MQ

Papers in this session are related to design, development and testing of new or innovative electronic controls or control systems for internal combustion engines. Topics may include hardware, software and algorithm/function innovations as well as the associated sensors or actuators employed in the control system. Applications may range from very simple systems for 1-cylinder engines to more complex systems for high-performance or multi-cylinder engines.

Organizers:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, ROBERT BOSCH CORP

Chairpersons:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, Robert Bosch Corp.

15:30 (2012-32-0046/20129046)

Use of Highly Integrated Components in the Design of Small Gasoline Engine Controllers

Ralph Ferrara, Freescale Semiconductor

16:00 (2012-32-0050/20129050)

The Control of Air-Fuel Ratio of the Engine Based on Model Predictive Control

Dinggen Li, Yang Ye, Huazhong University of Science & Technology

16:30 (2012-32-0044/20129044)

Model Based Engine Speed Evaluation for Single-Cylinder Engine Control

Silke Seuling, Haris Hamedovic, Wolfgang Fischer, Frank Schuerg, Robert Bosch GmbH

17:00 (2012-32-0043/20129043)

Cost-Innovative 2-Wheeler ECU with Novel Molded Housing Concept and Direct Connecting System

Mike Wolter, Eckhardt Philipp, Andreas Maucher, Stephan Luetzerath, Tobias Kallerhoff, Gunaseelan Rathinam, Robert Bosch GmbH, Germany

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00306, and also individually. To purchase visit collections.sae.org

Engine Technology (Part 3 of 5) (SETC110)

15:30

Room - Rooms LP

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation.

Organizers:

Dr. Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

Chairpersons:

Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

15:30 (2012-32-0054/20129054)

Optimization of Engine Cooling Through Conjugate Heat Transfer Simulation and Analysis of Fins

Anish Gokhale, N Karthikeyan, Mahindra 2 Wheelers

16:00 (2012-32-0066/20129066)

Conceptual Design of Small Direct-Injection Spark-Ignition Engine Concepts with Various Injector Positions by Use of CAE-Tools

Joern Schech, Arne Siedentop, Fabian Herbst, Alexander Wiebe, Peter Eilts, Technische Universitaet Braunschweig

16:30 (2012-32-0068/20129068)

An Empirically Integrated CFD Method for Racing Engine Layout and Its Practical Demonstration

Shinsuke Yasui, Daisuke Nakamura, Honda Racing Corporation

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00307, and also individually. To purchase visit collections.sae.org

HCCI (Part 1 of 2) (SETC113)

15:30

Room - Hall of Ideas I

This session focuses on studies of auto ignition combustion including HCCI and other low temperature combustion regimes. Experimental and simulation studies pertaining to various means of controlling combustion are welcome.

Organizers:

William P. Attard, MAHLE Powertrain LLC; Kenji Nishida, Honda R&D Co., Ltd.

Chairpersons:

William P. Attard, MAHLE Powertrain LLC; Kenji Nishida, Honda R&D Co., Ltd.

15:30 (2012-32-0077/20129077)

An Investigation on DME HCCI Engine about Combustion Phase Control using EGR Stratification by Numerical Analysis

Narankhuu Jamsran, Ocktaeck Lim, University of Ulsan; Norimasa Iida, Keio University

16:00 (2012-32-0074/20129074)

Reactivity Controlled Compression Ignition (RCCI) in a Single-Cylinder Air-Cooled HSDI Diesel Engine

Kyle Pohlkamp, Rolf Reitz, UW-Madison

16:30 (2012-32-0075/20129075)

Analysis of Combustion Characteristics and Efficiency Improvement of a Supercharged HCCI Engine Achieved by Using the Different Ignition Characteristics of Gaseous Fuels

Yoshihiro Ishikawa, Nihon University Graduate School; Akira Iijima, Koji Yoshida, Hideo Shoji, Nihon University

17:00 (2012-32-0076/20129076)

A Computational Study of the Combined Effects of EGR and Boost Pressure on HCCI Autoignition

Dong Won Jung, Norimasa Iida, Keio University

Planned by SETC General Committee / EMB Land and Sea Group

Measurement and Simulation (Part 1 of 3)
(SETC117)

15:30

Room - Rooms KO

The session is associated with engine and vehicle simulation tasks and their related measurements. Simulation and measurement methodology as well as the simulation and measurement application on development tasks will find a place within the session.

Organizers:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of technology

Chairpersons:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of Technology

15:30 (2012-32-0095/20129095)

Assessment of the Influence of Intake Duct Geometrical Parameters on the Tumble Motion Generation in a Small Gasoline Engine

Stefania Falfari, Federico Brusiani, Gian Marco Bianchi, University of Bologna

16:00 (2012-32-0096/20129096)

3D CFD Analysis of the Influence of Some Geometrical Engine Parameters on Small PFI Engine Performances - The Effects on Tumble Motion and Mean Turbulent Intensity Distribution

Stefania Falfari, Gian Marco Bianchi, University of Bologna; Luca Nuti, Piaggio & C SpA

16:30 (2012-32-0098/20129098)

Simulation of Wankel Engine Performance Using Commercial Software for Piston Engines

Leonid Tartakovsky, Vladimir Baibikov, Marcel Gutman, Mark Veinblat, Technion Israel Inst. of Technology; Jonathan Reif, Elbit Systems Ltd

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00308, and also individually. To purchase visit collections.sae.org

Wednesday
October 17

Alternative Fuels (Part 3 of 5) (SETC102)

10:30

Room - Hall of Ideas H

This session invites paper focused on aspects of operating small engines on non-petroleum based fuels or non-conventional blends of fuels. This includes performance metrics such as power, efficiency and emissions. It also covers durability considerations including materials compatibility, wear rates, etc. These three particular papers focus on the use of alcohol in spark ignition engines.

Organizers:

Shusuke Okada, Yanmar Co., Ltd.; Paul Richards; Koji Yoshida, Nihon University

Chairpersons:

Roland Kirchberger, Graz University of Technology; Koji Yoshida, Nihon University

10:30 (2012-32-0013/20129013)

Hydrogen Gas in Diesel Engine using DEE as Ignition Source

Chinnathambi Dhanasekaran, Vels University; Gabriel Mohan Kumar, Park College of Engineering Technology

11:00 (2012-32-0019/20129019)

Ammonia Plus Hydrogen as Fuel in a S.I. Engine: Experimental Results

Stefano Frigo, Roberto Gentili, Università degli Studi di Pisa; Nicolò Doveri, EDI Progetti

11:30 (2012-32-0015/20129015)

Identification of Optimal CNG -Hydrogen Enrichment Ratio in the Small SI Engines

Bartosz Flekiewicz, Auto Gaz Slask; Marek Flekiewicz, Grzegorz Kubica, Silesian University of Technology

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00305, and also individually. To purchase visit collections.sae.org

Engine Technology (Part 4 of 5) (SETC110)

10:30

Room - Rooms LP

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation.

Organizers:

Dr. Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

Chairpersons:

Nagesh Mavinahally, MavinTech, LLC.; James H. Wang, Industrial Technology Research Institute

10:30 (2012-32-0059/20129059)

Expansion to Higher Efficiency - Investigations of the Atkinson Cycle in Small Combustion Engines

Patrick Pertl, Alexander Trattner, Andrea Abis, Stephan Schmidt, Roland Kirchberger, Graz University of Technology; Takaaki Sato, DENSO Automotive Deutschland GmbH

11:00 (2012-32-0060/20129060)

Compressed Air as a Quality and Pollution Free Fuel Substitute in Reciprocating Engines - an Effect of the Cam Profile on the Engine Performance

Takayuki Sugita, Sanyo High School in Hiroshima

11:30 (2012-32-0067/20129067)

Experimental and Numerical Comparison of Fuel Economy for 125cc Motorcycles with Carburetor or Electronic Port Fuel Injection Based on Different Drive Cycles

Frank Schuerg, A. Prashanth, Thorsten Raatz, Robert Bosch GmbH; Dani C, K. Manikandan, V Padmanabhan, Robert Bosch India Ltd

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00307, and also individually. To purchase visit collections.sae.org

Hybrid, Electric Drive, and Fuel Cell (Part 1 of 2) (SETC114)

10:30

Room - Rooms KO

In Part 1 of the Hybrid, Electric Drive, and Fuel Cell Session we have three papers. The first describes a novel approach to a hybrid motorcycle designed to reduce fuel consumption. The next two involve ICE range extenders. One is designed for low noise and the other for low cost.

Organizers:

Glenn Bower, Univ. of Wisconsin Madison; Jay Meldrum, Michigan Technological Univ.; Yasuyuki Muramatsu, Yamaha Motor Co., Ltd.

Chairpersons:

Jay Meldrum, Michigan Technological Univ.; Yasuyuki Muramatsu, Yamaha Motor Co., Ltd.

10:30 (2012-32-0086/20129086)

Effect by Fuel Cut with the Strong Hybrid Motorcycle to Improve the Fuel Consumption

Yuki Hosoi, Yamaha Motor Co., Ltd.

11:00 (2012-32-0081/20129081)

A Low NVH Range-Extender Application with a Small V-2 Engine - Based on a New Vibration Compensation System

Martin Pischinger, Dean Tomazic, FEV Inc.; Karsten Wittek, FEV GmbH; Hans-Joachim Esch, Eduard Köhler, KSPG AG; Moritz Baehr, VKA, RWTH Aachen University

11:30 (2012-32-0083/20129083)

Low Cost Range Extender Technology for Hybrid Electric City Scooters

Hans-Juergen Schacht, Oliver Schoegl, Niko Bretterklieber, Roland Kirchberger, Stephan Schmidt, Graz University of Technology

Planned by SETC General Committee / EMB Land and Sea Group

Measurement and Simulation (Part 2 of 3) (SETC117)

10:30

Room - Rooms MQ

The session is associated with engine and vehicle simulation tasks and their related measurements. Simulation and measurement methodology as well as the simulation and measurement application on development tasks will find a place within the session.

Organizers:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of Technology

Chairpersons:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of Technology

10:30 (2012-32-0104/20129104)

Prediction Method of Surface Pressure against Gasket in Consideration of Creep on Cylinder Head in Air-Cooled Engines

Naoto Ono, Makiko Sugano, Atsushi Fukatsu, Hirofumi Fujiwara, Honda R&D Co., Ltd.

11:00 (2012-32-0102/20129102)

Connecting Rod Buckling Analysis Using Eigenvalue and Explicit Methods

Arden Anderson, Mercury Marine; Masahiro Yukioka, Mercury Racing

11:30 (2012-32-0101/20129101)

Strength Analysis of ATV Body Frame Using Computer Simulation

Daisuke Iwata, Yoshinobu Matsumoto, Suzuki Motor Corporation

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00308, and also individually. To purchase visit collections.sae.org

Two-Stroke Engines (Part 2 of 4) (SETC120)

10:30

Room - Hall of Ideas I

This session contains manuscripts focused on two-stroke engines. Topics such as emissions, performance, and efficiency will be explored. Advanced combustion control, direct fuel injection, simulation models and experimental results will be presented.

Organizers:

Scott A. Miers, Michigan Technological University; Kazuyuki Shiomi, Honda R&D Co., Ltd.

Chairpersons:

Hiromi Deguchi, Suzuki Motor Corp.; Scott A. Miers, Michigan Technological Univ.

10:30 (2012-32-0113/20129113)

Air Assisted Direct Cylinder Barrel Injection of Gasoline in a Two - Stroke S.I Engine

Ciju Paul, Indian Space Research Organization; Pradeep V, A Ramesh, Indian Institute of Technology Madras

11:00 (2012-32-0117/20129117)

Design of Retrofit Kit for LPG Driven Direct Injection Two-Stroke Engines

Yee Hern Tan, University Science Malaysia; Horizon Gitano, University of Kuala Lumpur

11:30 (2012-32-0115/20129115)

Development of a Transfer Port Injection System for Two-Stroke Engines

Yee Hern Tan, University Science Malaysia; Horizon Gitano, University of Kuala Lumpur; Ahmad Syazli Mohd Khalil, University Science Malaysia

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00309, and also individually. To purchase visit collections.sae.org

Wednesday October 17

Alternative Fuels (Part 4 of 5) (SETC102)

13:30

Room - Hall of Ideas H

This session invites paper focused on aspects of operating small engines on non-petroleum based fuels or non-conventional blends of fuels. This includes performance metrics such as power, efficiency and emissions. It also covers durability considerations including materials compatibility, wear rates, etc. These two particular papers focus on the use of gaseous fuels.

Organizers:

Shusuke Okada, Yanmar Co., Ltd.; Paul Richards; Koji Yoshida, Nihon University

Chairpersons:

Brian J. Callahan, Achates Power Inc.; Shusuke Okada, Yanmar Co., Ltd.

13:30 (2012-32-0017/20129017)

Combustion and Emissions with Bio-alcohol and Nonesterified Vegetable Oil Blend Fuels in a Small Diesel Engine

Hideyuki Ogawa, Hari Setiaprada, Hokkaido Univ.; Kosuke Hara, Yanmar Co. Ltd.; Gen Shibata, Hokkaido Univ.

14:00 (2012-32-0020/20129020)

Comparison of Diesel Combustion between Ethanol and Butanol Blended with Gas Oil

Shohei Yamamoto, Yasuhiro Agui, Noritsune Kawaharada, Hironobu Ueki, Daisaku Sakaguchi, Masahiro Ishida, Nagasaki University

Planned by SETC General Committee / EMB Land and Sea Group

Engine Controls (Part 2 of 3) (SETC109)

13:30

Room - Rooms KO

Papers in this session are related to design, development and testing of new or innovative electronic controls or control systems for internal combustion engines. Topics may include hardware, software and algorithm/function innovations as well as the associated sensors or actuators employed in the control system. Applications may range from very simple systems for 1-cylinder engines to more complex systems for high-performance or multi-cylinder engines.

Organizers:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, ROBERT BOSCH CORP

Chairpersons:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, Robert Bosch Corp.

13:30 (2012-32-0053/20129053)

Unique Variable Reluctance System for Improved Noise Immunity

Mike Garrard, Freescale Semiconductor U.K.; William E. Edwards, Freescale Semiconductor Inc.

14:00 (2012-32-0048/20129048)

Fundamental Investigations on the Boost Pressure Control System of Charged Aircraft Engines in the Aviation Class ELA1 / Approved Systems Versus New Solutions

Reinhard Stelzl, Roland Kirchberger, Stephan Schmidt, Graz University of Technology; Michael Döpona, Wolfgang Wukisiewitsch, Nigel Foxhall, BRP-Powertrain GmbH & Co KG

14:30 (2012-32-0052/2012-32-0052)

Knock Control on Small Four-Two-Wheeler Engines

Timo Jahn, Frank Schuerg, Stefan Kempf, Robert Bosch GmbH

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00306, and also individually. To purchase visit collections.sae.org

Engine Technology (Part 5 of 5) (SETC110)

13:30

Room - Rooms LP

Advanced engine technologies, design, and development for thermal efficiency, performance, and emissions, including cycle simulation.

Organizers:

Dr. Nagesh Mavinahally, MavinTech, LLC.; Hideyuki Okumura, Yamaha Motor Co., Ltd.

Chairpersons:

Shosaku Chiba, Honda R&D Co., Ltd.; Nagesh Mavinahally, MavinTech, LLC.

13:30 (2012-32-0057/20129057)

The Numerical Investigation on the Performance of Rotary Engine with Leakage, Different Fuels and Recess Sizes

Dun-Zen Jeng, Ming-June Hsieh, Chih-Chuan Lee, ASRD, CSIST, Taichung, Taiwan; Yu Han, National Chung Hsing University, Taiwan

14:00 (2012-32-0064/20129064)

The Intake and Exhaust Pipe Effect on a Rotary Engine Performance

Dun-Zen Jeng, Ming-June Hsieh, Chih-Chuan Lee, ASRD, CSIST, Taichung, Taiwan; Yu Han, National Chung Hsing University, Taiwan

Planned by SETC General Committee / EMB Land and Sea Group

HCCI (Part 2 of 2) (SETC113)

13:30

Room - Rooms MQ

This session focuses on studies of auto ignition combustion including HCCI and other low temperature combustion regimes. Experimental and simulation studies pertaining to various means of controlling combustion are welcome.

Organizers:

William P. Attard, MAHLE Powertrain LLC; Kenji Nishida, Honda R&D Co., Ltd.

Chairpersons:

William P. Attard, MAHLE Powertrain LLC; Kenji Nishida, Honda R&D Co., Ltd.

13:30 (2012-32-0078/20129078)

Analysis of the Effects of a Higher Compression Ratio on HCCI Combustion Characteristics using In-cylinder Visualization and Spectroscopic Measurement

Tomoya Tojo, Nihon University Graduate School; Koji Yoshida, Akira Iijima, Hideo Shoji, Nihon University; Akira Terashima, Kenta Suyama, Nihon University Graduate School

14:00 (2012-32-0079/20129079)

A Study of the Mechanism Producing Autoignition in an HCCI Engine Using In-Cylinder Spectroscopy and Chemical Kinetic Simulation

Akira Iijima, Nihon University; Tomoya Tojo, Akira Terashima, Kenta Suyama, Nihon University Graduate School; Koji Yoshida, Hideo Shoji, Nihon University

14:30 (2012-32-0080/20129080)

A Spectroscopic Study of the Effects of Multicomponent Fuel Blends on Supercharged HCCI Combustion

Mitsuo Asanuma, Nihon University Graduate School; Akira Iijima, Koji Yoshida, Hideo Shoji, Nihon University; Go Emori, Nihon University Graduate School

Planned by SETC General Committee / EMB Land and Sea Group

Two-Stroke Engines (Part 3 of 4) (SETC120)

13:30

Room - Hall of Ideas I

This session contains manuscripts focused on two-stroke engines. Topics such as emissions, performance, and efficiency will be explored. Advanced combustion control, direct fuel injection, simulation models and experimental results will be presented.

Organizers:

Scott A. Miers, Michigan Technological University; Kazuyuki Shiomi, Honda R&D Co., Ltd.

Chairpersons:

Akihito Kasai, Honda R&D Co., Ltd.; Scott A. Miers, Michigan Technological Univ.

13:30 (2012-32-0110/20129110)

Spark Ignition System for Direct-Injected Gasoline Two Stroke Engine

Michael J. French, BRP US Inc.

14:00 (2012-32-0118/20129118)

Electronically Controlled Batteryless Injection System for Small Two-Stroke SI Engines

Arno Kinnen, Wolfgang Layher, Heiko Däschner, Andreas STIHL AG & Co. KG

Planned by SETC General Committee / EMB Land and Sea Group

Alternative Fuels (Part 5 of 5) (SETC102)

15:30

Room - Hall of Ideas H

This session invites paper focused on aspects of operating small engines on non-petroleum based fuels or non-conventional blends of fuels. This includes performance metrics such as power, efficiency and emissions. It also covers durability considerations including materials compatibility, wear rates, etc. These three particular papers focus on the use of gaseous fuels including hydrogen.

Organizers:

Shusuke Okada, Yanmar Co., Ltd.; Paul Richards; Koji Yoshida, Nihon University

Chairpersons:

Robert Kee, Queen's University Belfast; Koji Yoshida, Nihon University

15:30 (2012-32-0016/20129016)

A Comparison of the Emissions from Gasoline vs. Compressed Natural Gas for an Electronic Fuel Injected Two Cylinder, Four-Stroke Engine

Amitabh S. Gautam, Robert Garrick, James Howard Lee, Chris M. Deminco, Philip E. Hannum, Larry A. Villasmi, Rochester Institute of Technology

Wednesday October 17

16:00 (2012-32-0021/20129021)

Potential of a Dual Fuel DI Diesel Engine Fuelled with Jatropha Curcas L. Oil and Producing Gas Derived from Biomass

Sopheak Rey, Institute of Technology of Cambodia; Chihiro Kondo, Koji Yamane, Kiyoshi Kawasaki, The University of Shiga Prefecture

Planned by SETC General Committee / EMB Land and Sea Group

Collegiate Events (SETC103)

15:30

Room - Rooms MQ

Papers in this session discuss innovations regarding entries in the SAE Collegiate Design Series (CDS) events. This year two papers describe Formula SAE innovations. The first discusses a novel approach to improved fuel economy using part load mapping. The second describes a highly integrated parallel hybrid design for the Formula Hybrid competition.

Organizers:

Geoffrey McCullough, Queen's Univ. of Belfast; Jay Meldrum, Michigan Technological Univ.; Takashi Mitome, Suzuki Motor Corp.

Chairpersons:

Jay Meldrum, Michigan Technological Univ.; Takashi Mitome, Suzuki Motor Corp.

15:30 (2012-32-0026)

Highly Integrated Parallel Hybrid Powertrain

Dan Cordon, Samuel Wos, Steven Beyerlein, Edwin Odom, Univ of Idaho

16:00 (2012-32-0027/20129027)

Improving the Fuel Economy of a Tuned 600cc FSAE Engine

Thomas Leonard, James Leckey, Geoffrey McCullough, Queen's University of Belfast

Planned by SETC General Committee / EMB Land and Sea Group

Diesel Engines (Part 2 of 2) (SETC106)

15:30

Room - Rooms LP

Papers in this session will pertain to studies of naturally aspirated and boosted diesel engines including their design, emission control, NVH, fuel system, fuel type, aftertreatment, combustion quality, or engine control.

Organizers:

Daniel Nehmer, John Deere & Co.; Yoshiro Tokunaga, Kawasaki Heavy Industries, Ltd.

Chairpersons:

Daniel Nehmer, John Deere & Co.; Yoshiro Tokunaga, Kawasaki Heavy Industries, Ltd.

15:30 (2012-32-0030/20129030)

Soot Particles Generation Characteristics and Size Distribution in Diesel Engine using Improved Detail Soot Model

Ju Hongling, Xiaobei Cheng, Fangyang Wang, Huazhong University of Sci. &Tech.

16:00 (2012-32-0031/20129031)

Simultaneous Reduction of Pressure Rise Rate and Emissions in a Compression Ignition Engine by Use of Dual-Component Fuel Spray

Yoshimitsu Kobashi, Hiroki Maekawa, Satoshi Kato, Kanazawa Institute of Technology; Jiro Senda, Doshisha University

16:30 (2012-32-0035/20129035)

Technical Concepts on Non-Road Small Direct Injection Diesel Engines with Common Rail System

Tomoya Hasegawa, Tamotsu Kuno, Kentaro Kita, Akihiko Kai, Yuji Takemura, Osamu Yoshii, Tadao Okazaki, Hideya Miyazaki, Kubota Corporation

Planned by SETC General Committee / EMB Land and Sea Group

Hybrid, Electric Drive, and Fuel Cell (Part 2 of 2) (SETC114)

15:30

Room - Rooms KO

In Part 2 of the Hybrid, Electric, and Fuel Cell Session we have three papers. The first outlines a new way to predict State of Charge of a battery by an algorithm that augments the traditional Open Circuit Voltage measurement. The next paper discusses a unique hybrid that combines an ammonia fueled IC engine and a lithium battery powered motor. The final paper revisits and models the free piston engine concept.

Organizers:

Glenn Bower, Univ. of Wisconsin Madison; Jay Meldrum, Michigan Technological Univ.; Yasuyuki Muramatsu, Yamaha Motor Co., Ltd.

Chairpersons:

Jay Meldrum, Michigan Technological Univ.; Yasuyuki Muramatsu, Yamaha Motor Co., Ltd.

15:30 (2012-32-0084/20129084)

Model Development for the Compression Ignition Free Piston Engine Alternator

Huajie Ding, Xiumin Yu, College of Automotive Eng., Jilin Univ.; Junjie Li, Shanghai Volkswagen Automotive Company

16:00 (2012-32-0082/20129082)

A Heuristic Algorithm for Determining State of Charge of a Lead Acid Battery for Small Engine Applications

Anand Ganesan, Sudharsan Sundaram, Mahindra Two Wheelers Ltd., Pune, India.

16:30 (2012-32-0085/20129085)

A Hybrid Vehicle Powered by Hydrogen and Ammonia

Giuseppe Pozzana, Neri Bonfanti, Pont-Tech srl, Pontedera Italy; Stefano Frigo, Energia e Sistemi Univ. Pisa, Italy; Nicolò Doveri, EDI Progetti&Sviluppo, Pontedera, Italy; Paolo Dario, Scuola Superiore Sant'Anna, Italy; Virgilio Mattoli, Center for Micro-BioRobotics, IIT, Italy; Marina Ragnoli, Acta Energy spa, Crespina, Italy

Planned by SETC General Committee / EMB Land and Sea Group

Two-Stroke Engines (Part 4 of 4) (SETC120)

15:30

Room - Hall of Ideas I

This session contains manuscripts focused on two-stroke engines. Topics such as emissions, performance, and efficiency will be explored. Advanced combustion control, direct fuel injection, simulation models and experimental results will be presented.

Organizers:

Scott A. Miers, Michigan Technological University; Kazuyuki Shiomi, Honda R&D Co., Ltd.

Chairpersons:

Scott A. Miers, Michigan Technological Univ.; Tomoo Shiozaki, Honda R&D Co., Ltd.

15:30 (2012-32-0111/20129111)

Future Engine Technology in Hand-Held Power Tools

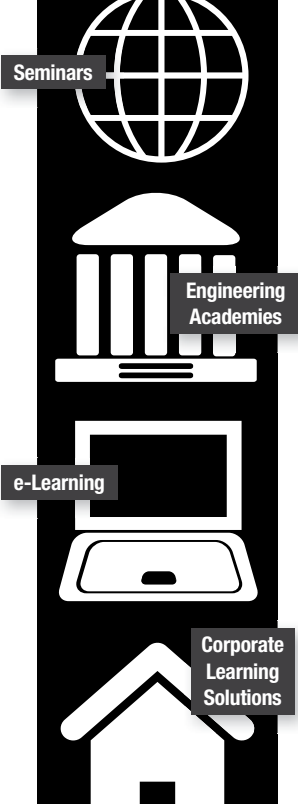
Alexander Trattner, Stephan Schmidt, Roland Kirchberger, Helmut Eichlseder, Graz University of Technology; Armin Kölmel, Michael Raffenberg, Tim Gegg, Andreas STIHL AG & Co. KG

16:00 (2012-32-0112/20129112)

The Impact of Titan Inserts in Piston on the Parameters of Two-Stroke Engine Performance

Maciej Bajerlein, Jerzy Merkisz, Lukasz Rymaniak, Andrzej Ziolkowski, Poznan Univ of Technology

Planned by SETC General Committee / EMB Land and Sea Group



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P110042

Thursday
October 18

Emissions and Environmental Impacts

(SETC107)

08:30

Room - Rooms MQ

This session focuses on general topics in emissions including emission formation mechanisms, techniques to reduce engine-out emissions, impact of fuel composition, after-treatment, and controls and environmental impacts.

Organizers:

James Carroll, Southwest Research Institute; Hiromi Deguchi, Suzuki Motor Corp.; Roy Douglas, Queen's Univ. of Belfast; Philip Pierce, HARLEY DAVIDSON MOTOR CO

Chairpersons:

Hiromi Deguchi, Suzuki Motor Corp.; Philip Pierce, HARLEY DAVIDSON MOTOR CO

08:30 (2012-32-0039/20129039)

Small SI Engine Evaporative Emission Control

Sam Reddy, Evaporative Emissions Consulting Inc.

09:00 (2012-32-0038/20129038)

Influence of the Alcohol Type and Concentration in Alcohol-Blended Fuels on the Combustion and Emission of Small Two-Stroke SI Engines

Markus Bertsch, Kai W. Beck, MOT GmbH; Ulrich Spicher, Karlsruhe Inst of Technology; Armin Kölmel, Ute C. Dawin, Holger Lochmann, Stefan Schweiger, Andreas STIHL AG & Co. KG

09:30 (2012-32-0070/20129070)

Comparison of the Emission Behaviour and Fuel Consumption of a Small Two-Stroke SI Chainsaw under Test-Bed- and Real In-Use Conditions

Markus Bertsch, Kai Beck, MOT GmbH; Patrick Ulmerich, Hans Van den Hoevel, AVL Deutschland GmbH; Ulrich Spicher, Karlsruhe Institute of Technology

10:00 (2012-32-0036/20129036)

Applications to the Off-Road Engines by Ultra-Small DOC Containing Metal Special Structure Design Substrates - Compact & Cost Effective with Small Aftertreatment System

Tetsuo Nohara, Kazunari Komatsu, EMITEC Japan; Tatsuya Morimoto, Keita Naito, Kubota Corporation

Planned by SETC General Committee / EMB Land and Sea Group

Engine Controls (Part 3 of 3) (SETC109)

08:30

Room - Hall of Ideas I

Papers in this session are related to design, development and testing of new or innovative electronic controls or control systems for internal combustion engines. Topics may include hardware, software and algorithm/function innovations as well as the associated sensors or actuators employed in the control system. Applications may range from very simple systems for 1-cylinder engines to more complex systems for high-performance or multi-cylinder engines.

Organizers:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, ROBERT BOSCH CORP

Chairpersons:

Yutaka Nitta, Suzuki Motor Corp.; Tony Szczotka, Robert Bosch Corp.

08:30 (2012-32-0047/20129047)

Vehicle Calibration Techniques Established and Substantiated for Motorcycles

Satoru Kanno, Koichi Tsunokawa, Takashi Suda, Keihin Corporation

09:00 (2012-32-0051/20129051)

Development of DBW System for Motorcycles with Fast Response and Layout Flexibility

Hiroshi Jimbo, Hiroshi Nakayama, Keihin Corp.

09:30 (2012-32-0049/20129049)

912iS Fuel Injected Aircraft Engine

Michael Dopona, Nigel Foxhall, Christoph Dutzler, BRP-Powertrain GmbH & Co. KG

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00306, and also individually. To purchase visit collections.sae.org

Materials (Part 2 of 2) (SETC116)

08:30

Room - Rooms LP

This session will focus on the structure, processing, and properties of materials in small engine applications. Some possible topics include lightweighting of engine and vehicle components; heat treatment and surface processing; fatigue, fracture, and wear; coatings; and advanced ceramic, metallic, and polymeric materials.

Organizers:

Hiroataka Kurita, Yamaha Motor Co., Ltd.; David Palmer, BRP US Inc.

Chairpersons:

Hiroataka Kurita, Yamaha Motor Co., Ltd.; David Elijah Palmer, BRP US Inc.

08:30 (2012-32-0089/20129089)

Development of Waterborne Conductive Primer for Motorcycles

Akiko Tanaka, Tomoyuki Inoue, Shinsuke Mochizuki, Honda R&D Co., Ltd.; Masanobu Inoue, Nippon Bee Chemical Co., Ltd.

09:00 (2012-32-0092/20129092)

Optimizing the Cylinder Running Surface / Piston System of Internal Combustion Engines Towards Lower Emissions

Peter Ernst, Sulzer Metco AG (Switzerland); Bernd Distler, Sulzer Metco (US) Inc.

09:30 (2012-32-0090/20129090)

Evaluation of the Tribological Property of Resin Coating by the Addition of Nylon and Graphite Particles

Nobuyuki Suzuki, Akio Hikasa, Suzuki Motor Corp.

Planned by SETC General Committee / EMB Land and Sea Group

Measurement and Simulation (Part 3 of 3) (SETC117)

08:30

Room - Rooms KO

The session is associated with engine and vehicle simulation tasks and their related measurements. Simulation and measurement methodology as well as the simulation and measurement application on development tasks will find a place within the session.

Organizers:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of technology

Chairpersons:

Tadao Okazaki, Kubota Corp.; Stephan Schmidt, Graz University of Technology

08:30 (2012-32-0105/20129105)

Development of a Micro-Engine Testing System

Andrew Wiegand, Scott Miers, Jason Blough, Michigan Technological University; Darin Kowalski, Andy Biske, US Army TARDEC

09:00 (2012-32-0099/20129099)

Fuel Consumption and Power Performance Prediction in Outboard Motors for High-Speed Planing Boats using CFD Simulation

Shunsuke Kurioka, Honda R&D Co., Ltd.

09:30 (2012-32-0100/20129100)

Investigation of Combustion Diagnosis System Applied for the Development of General Purpose Utility Engines

Toshiro Kiura, Naohiro Ikeda, Takayuki Aoki, Honda R&D Co., Ltd.

10:00 (2012-32-0097/20129097)

Development of Real World Driving Cycle for Vehicle Durability Evaluation

Gagandeep Singh Risam, Anil Singanamalli, Sasun C, Rajasekaran T, TVS Motor Company Ltd.

Planned by SETC General Committee / EMB Land and Sea Group

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00308, and also individually. To purchase visit collections.sae.org

NVH Technology (SETC118)

08:30

Room - Hall of Ideas H

All aspects of small engine related noise and vibration are covered in this session including: generation, experimental techniques, measurement, numerical analysis, NVH materials, source identification, NVH quality and novel solutions.

Organizers:

Ken Kicinski, HARLEY-DAVIDSON; Masahiko Sugimoto, Kubota Corporation

Chairpersons:

Ken Kicinski, HARLEY-DAVIDSON; Toshimi Kobayashi, Kawasaki Heavy Industries, Ltd.

08:30 (2012-32-0106/20129106)

360° vs. 270° vs. 180°: The Difference of Balancing a 2 Cylinder Inline Engine: Design, Simulation, Comparative Measurements

Christian Hubmann, Wolfgang Schoeffmann, Hubert Friedl, Bernhard Graf, AVL LIST GmbH

09:00 (2012-32-0108/20129108)

Study of Engine Mount Layout for Industrial Diesel

Masahiro Akei, Kouichi Kouzato, Toshiyuki Uyama, Yanmar Co. Ltd.

09:30 (2012-32-0107/20129107)

Acoustic Studies of Micro-Perforates for Small Engine Silencers

Raimo Kabral, TUT/KTH Royal Institute of Technology; Hans Rämmal, Jüri Lavrentjev, Tallinn University of Technology

Thursday October 18

10:00 (2012-32-0109/20129109)

A Novel Design for Cruiser Type Motorcycle Silencer Based on Micro-Perforated Elements

Raimo Kabral, TUT/KTH Royal Institute of Technology; Hans Rämml, Fabio Auriemma, Tallinn University of Technology; Janek Lupp, Lettore; Risto Koiv, Tallinn University of Technology; Heiki Tiikola, KTH Royal Institute of Technology; Jüri Lavrentjev, Tallinn University of Technology

Planned by SETC General Committee / EMB Land and Sea Group

Advanced Combustion (Part 3 of 3) (SETC101)

11:00

Room - Rooms LP

This session focuses on advanced combustion technologies in both 4-stroke and 2-stroke engines. The scope of topics includes studies of mixture formation, dilution effects, ignition, abnormal combustion, engine efficiency, flame propagation, and emissions formation.

Organizers:

William P. Attard, MAHLE Powertrain LLC; Yasuo Moriyoshi, Chiba Univ.; Kenji Nishida, Honda R&D Co., Ltd.

Chairpersons:

William P. Attard, MAHLE Powertrain LLC; Yoshimitsu Kobashi, Kanazawa Institute of Technology

11:00 (2012-32-0002/20129002)

Visualization of Propane and Natural Gas Spark Ignition and Turbulent Jet Ignition Combustion

Elisa Toulson, Andrew Huisjen, Xuefei Chen, Cody Squibb, Guoming Zhu, Harold Schock, Michigan State University; William P. Attard, MAHLE Powertrain LLC

11:30 (2012-32-0005/20129005)

Effects of Turbulence on Mixture Stratification in a Small-Bore Utility Engine

Michael Tess, Jaal Ghandhi, Univ of Wisconsin Madison

Planned by SETC General Committee / EMB Land and Sea Group

Lubricants (SETC115)

11:00

Room - Rooms MQ

Lubricants, Lubricant Performance, Lubricant Additives, Tribology, Friction, and Wear

Organizers:

Brent R. Dohner, Lubrizol Corp.; Tomoo Shiozaki, Honda R&D Co., Ltd.

Chairpersons:

Brent R. Dohner, Lubrizol Corp.; Hirotaka Kurita, Yamaha Motor Co., Ltd.

11:00 (2012-32-0087/20129087)

Highly Efficient Lubricant for Sport Motorcycle Application - Fuel Economy and Durability Testing

Gianluigi Zoli, Cliff Newman, May Turner, Matthew Symonds, Castrol Ltd

Planned by SETC General Committee / EMB Land and Sea Group

Vehicle Dynamics (SETC121)

11:00

Room - Rooms KO

Organizers:

Masayuki Baba, Honda R&D Co., Ltd.; Kay Stepper, Bosch Industries

Chairpersons:

Masayuki Baba, Honda R&D Co., Ltd.; Brian J. Callahan, Achates Power Inc.

11:00 (2012-32-0122/20129122)

Relation between the Weave Mode in Low Speed Range and Slalom Running of Motorcycles

Tomoaki Kishi, Toshifumi Uchiyama, Shigeru Fujii, Yamaha Motor Co., Ltd.

11:30 (2012-32-0123/20129123)

Research on Engine Torque Control with Acceleration Performance for MotoGP Class Racing Motorcycles

Yukihide Akitsu, Honda Racing Corporation

Planned by SETC General Committee / EMB Land and Sea Group

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Oct 8th - Oct 10th, 2013
Taipei International Convention Center (TICC)
Taipei, Taiwan

Due Dates:

Abstracts due: **January 28, 2013**
Draft manuscripts due: **April 1, 2013**
Final manuscripts due: **July 1, 2013**



Liberty Square, Taipei

FOREWORD

JSAE, Society of Automotive Engineers of Japan, announces that the 19th Small Engine Technology Conference (SETC) will be held in Taipei from October 8 to 10, 2013. JSAE and SAE International jointly sponsor the Conference with the support of SAE International Taipei Section of Taiwan, Japan Land Engine Manufacturers Association (LEMA) and Japan Boating Industry Association (JBIA).

JSAE encourages researchers and engineers in a diversified field of small engine technology to submit their papers to the Conference and participate in it to exchange their ideas. This will contribute to meeting key persons and sharing new technological information.

Plenary session, Exhibition and Technical visit will be planned for enlarging your experience.

Academic exhibition linked with technical activity will be also planned to support presentation of work in progression various fields.

SETC2013 SECRETARIAT

Society of Automotive Engineers of Japan, Inc
10-2 Goban-cho, Chiyoda-ku, Tokyo 102-0076, Japan
Tel : +81-3-3262-8214 Fax: +81-3-3261-2204
E-mail: SETC2013@jsae.or.jp



National Palace Museum, Taipei

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EXHIBITOR PROFILES

Exhibitor Directory text is published as submitted by exhibiting companies.

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ACS

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United States
www.acscm.com
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ACS delivers total engine and vehicle test equipment and facility integration services. Our expertise includes design, specification, procurement, installation management, and commissioning for test equipment, single test cells, and entire technical centers. Our approach to integrating test equipment and the facility assures the integrity of your data.

A&D Technology Inc.

4622 Runway Blvd
Ann Arbor, MI 48108
United States
401

A&D Technology is a global supplier of test and simulation systems that are ideally suited for a wide range of applications, including conventional and hybrid-electric engine and powertrain development. These solutions provide tools for test cell automation, simulation and centralized laboratory management. The open system architecture facilitates the easy integration of a broad range of test equipment and generated test data.

AVL

47603 Halyard Dr.
Plymouth, MI 48170
United States
www.avl.com
303

AVL is the world's largest privately owned and independent company for the development of gasoline, diesel, alternative fuel, electric and hybrid powertrain systems. The company offers combined solutions of powertrain engineering, simulation software, testing and instrumentation systems. AVL's North American Headquarters is located in the Detroit suburb of Plymouth, Michigan.

B

BRP US Inc.

10101 Science Dr.
Sturtevant, WI 53177
United States
411

BRP is a world leader in designing, developing, manufacturing, distributing and marketing motorized recreational vehicles for powersports enthusiasts. BRP's portfolio of brands and products includes: Ski-Doo® and Lynx® snowmobiles, Sea-Doo® watercraft and boats, Evinrude® and Johnson® outboard engines, direct injection technologies such as E-TEC®, Can-Am® all-terrain and side-by-side vehicles and roadsters, Rotax® engines for karts, motorcycles, ultra light and light aircraft.

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C

Cambustion Ltd

347 Cherry Hinton Road
Cambridge CB1 8DH
United Kingdom
304

Cambustion's fast response gas and particulate analyzers are used globally for engine and after-treatment development. As permissible emissions levels reduce, the contribution to cycle emissions from transient operating conditions becomes more significant. Cambustion's fast response analyzers pinpoint transient conditions with high emissions, paving the way to efficient emissions compliance.

CD-adapco

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Melville, NY 11747
United States
www.cd-adapco.com
300

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Convergent Science, Inc.

6405 Century Ave Ste 102
Middleton, WI 53562
United States
400

Convergent Science Inc. (CSI) has developed the CONVERGE CFD software to make modeling of internal combustion engines fast, easy and accurate. To this end, CONVERGE generates a body fitted grid automatically at runtime, thus eliminating all user meshing time. The experience, software and expertise CSI offers the engine community assists in making engines cleaner and more fuel efficient with a shorter development time. If you're thinking engine simulation, think Convergent Science Inc: the experts in engine CFD.

CW Bearing USA, Inc.

28550 Cabot Dr Ste 700
Novi, MI 48377
United States
www.cwbearing.com
410

CW Bearing (USA) Inc. is part of the international family-owned enterprise Cixing Group Co. Ltd., headquartered in Ningbo China. CW Bearing is one of the leading ball bearing manufacturers in China for automotive, electric motors, gearboxes, outdoor products, power tools, & home appliances. ISO 9001 & TS 16949 Certified.

E

ECO-PowerDrive / Graz University of Technology

Inffeldgasse 25b
Graz, 8010
Austria
www.ecopowerdrive.at
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The research program of ECO-PowerDrive focuses on the reduction of pollutants and CO2 emission and on hybrid concepts for two-wheelers, recreation vehicles and small engine applications. Thematic and technological synergies will be used to develop competitive and cost efficient methods, technologies and tools. Under the guidance of the Institute of Internal Combustion Engines and Thermodynamics at Graz University of Technology 20 researchers from 3 scientific institutions and 7 company partners at 9 locations focus a sustainable development.

ETAS Inc.

3021 Miller Rd
Ann Arbor, MI 48103
United States
www.etas.com
203

ETAS provides a comprehensive product portfolio of integrated tools designed to increase quality and efficiency in the development and maintenance of embedded systems, with complete solutions for control system modeling/integration, HiL, rapid-prototyping, and measurement/calibration. Our tools are widely deployed in automotive, off-highway, and adjacent segments of the embedded industry.

ElectroJet Inc.

7717 Lochlin Dr
Brighton, MI 48116
United States
www.electrojet.org
404

Since 2003, ElectroJet has been pioneering electronic control systems for small engines. Today this includes state of the art electronics combined with a platform design approach for designing a complete engine management system specifically for small engines.

Euro-Tech Corporation

N48 W14170 Hampton Ave
Menomonee Falls, WI 53051
United States
www.eurotechcorp.com
301

Established in 1993, Euro-Tech represents unique European-made gages, tooling products such as arbors, chucks, drills, taps, measurement systems and accessories. We also offer the PG 1000 Cutting Tool Inspection System and the Pinhead Flexible Fixturing System for Coordinated Measuring Machines. The industries we serve include automotive, aeronautical and small engine.

F

FEV Inc.

4554 Glenmeade Ln
Auburn Hills, MI 48326
United States
202

The FEV Group is an internationally recognized powertrain and vehicle engineering company that supplies the global transportation industry.

Freescale Semiconductor Inc.

6501 W William Cannon Dr.
Austin, TX 78735
United States
403

Freescale is the global leader in embedded processing solutions, advancing the automotive, consumer, industrial and networking markets. From microprocessors and microcontrollers to sensors, analog ICs and connectivity – our technologies are the foundation to the innovations that make our world greener, safer, healthier and more connected.

G

GKN Sinter Metals

3300 University Dr.
Auburn Hills, MI 48326
United States
206

GKN Sinter Metals is the world's largest producer of precision powder metal products. With a focus on superior delivery, quality and total solutions, the company offers extensive technical expertise in design, testing and various process technologies. GKN Sinter Metals provides a wide range of products for engines, transmissions, drivetrains, and interiors for both the automotive and industrial markets.

H

Harley Davidson Motor Company

11800 W Capitol Dr.
Wauwatosa, WI 53222
United States
204

Sponsor

Harley-Davidson fulfills dreams inspired by the many roads of the world by providing extraordinary motorcycles and customer experiences. Harley-Davidson fuels the passion for freedom, independence and individuality with an iconic brand that transcends cultures, gender and age. Harley-Davidson produces heavyweight custom, cruiser and touring motorcycles and offers a complete line of motorcycle parts, accessories, riding gear and apparel, and general merchandise.

Heraeus Precious Metals GmbH & Co KG Business Unit Catalysts

Heraeusstrasse 12 14
Hanau 63450
Germany
www.heraeus-catalysts.com
201

Heraeus is a globally active precious metal and technology group based in Hanau, near Frankfurt, Germany covering precious metals, materials and technologies, sensors, biomaterials, medical, dental and pharmaceutical products, quartz glass, and specialty light sources. The catalysts program comprises chemical catalysts, emission catalysts and selected catalysts for special applications.

Honda R&D Co Ltd

3 15 1 Sensui Asaka-Shi
Saitama 351-8555
Japan
310

Honda operates under the basic principles of "Respect for the Individual" and "The Three Joys" - commonly expressed as The Joy of Buying, The Joy of Selling and The Joy of Creating. "Respect for the Individual" reflects our desire to respect the unique character and ability of each individual person, trusting each other as equal partners in order to do our best in every situation. Based on this, "The Three Joys" expresses our belief and desire that each person working in, or coming into contact with our company, directly or through our products, should share a sense of joy through that experience. In line with these basic principles, Honda has remained on the leading edge by creating new value and providing products of the highest quality at a reasonable price for worldwide customer satisfaction and has conducted its activities with a commitment to protecting the environment and enhancing safety.

K

Keihin Corporation

2021-8 Hoshakujji Takanezawa Town
Shioya Cty Tochigi Pref 329 1233
Japan
211

Keihin's proudest technology is the mechatronics which is the fusion of "mechanics" and "electronics". Keihin utilizes its technological expertise and development power nurtured in engine fuel supply products for motorcycle and automobile as well as air conditioners for automobile, and proposes overall systems, combining mechanical parts and electronic control unit. Additionally, we provide products for natural gas vehicles, ethanol vehicles, hybrid vehicles and fuel-cell vehicle as the best candidates for low-emission vehicles for the next generation. Keihin's ultimate objective is to pioneer advanced technology and reliable products to create better future for people, industry and society.

N

NCCAIP Pistons and Rings, Inc.

6454 West 74th St
Bedford Park, IL 60638
United States
402

NCCAIP Pistons and Rings Inc. is a joint venture between AIP India and NCC USA. AIP produces pistons, rings and cylinders for two and three wheel utility vehicles, lawn and garden engines, agriculture sprayers and compressor. NCC produces NCC COATINGTM which is a wear resistance, self lubricating nickel ceramic composite coating.

Nelson Global Products

180 US Highway 51 138
Stoughton, WI 53589
United States
307

Nelson Global Products manufactures high performance OEM and aftermarket products for on-highway and off-highway vehicles. Products include mufflers and silencers, exhaust tube assemblies, EGR and Thermal Management Tubing (TMT) for emissions systems and more.

P

Panther

50613 Varsity Ct
Wixom, MI 48393
United States
200

Panther Global Technologies is the leading global manufacturer of multi-piece and forged crankshafts for the Hand-held Lawn and Garden Implement Industry. With headquarters in Wixom, Michigan, and manufacturing facilities both at Wixom and in Ningbo, China, Panther has earned the reputation of a manufacturer of quality, precision crankshafts at globally competitive prices. Panther also produces a wide variety of other shafts and assemblies, and our Panther MetaflowTM process is a low-cost method for producing several assemblies, using a zinc injection molded assembly process.

Polaris

301 5th Ave SW
Roseau, MN 56751
United States
www.polaris.com
313

Polaris designs, engineers, manufactures and markets off-road vehicles (ORVs), including all-terrain vehicles (ATVs) and the Polaris RANGERTM, snowmobiles and Victory motorcycles for recreational and utility use and has recently introduced a new on-road electric powered neighborhood vehicle. Polaris is a recognized leader in the snowmobile industry; and one of the largest manufacturers of ORVs in the world.

R

Re-Sol LLC

1760 Opdyke Ct
Auburn Hills, MI 48326
United States
www.re-sol.com
311

Re-Sol (Reliable Solutions & Services) specializes in supplying flow measurement systems for engine and vehicle testing. These systems are tailored to individual needs for best performance and optimized budgets. Re-Sol is utilizing proven concepts and is applying knowledge gained over 25 years in this field.

Robert Bosch LLC

38000 Hills Tech Dr.
Farmington Hills, MI 48331
United States
www.bosch.us
205

Bosch Gasoline Systems is a systems provider and technology leader for modern gasoline injection systems for every type of vehicle. We also provide technologies and solutions for all types of automated transmissions and offer concept development and key components for CVT. We invest in new solutions for alternative drives, hybrids and electrification in powertrain to provide systems beyond Gasoline, and provide our customers worldwide with innovative solutions for all market segments - from low-price to high-end.

S

Synergeering Group, LLC

25335 Interchange Court
Farmington Hills, MI 48335
United States
www.rapidnylon.com
407

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Synerject

201 Enterprise Dr.
Newport News, VA 23603
United States
www.synerject.com
210

Synerject is a Joint Venture of the Continental Automotive and Orbital Corporations. Synerject designs and manufactures gasoline engine management and fuel systems for the Powersports, Two Wheel Transportation, and Lawn and Garden industries. Synerject's products can be found on Outboard and Inboard Marine Engines, Snowmobiles, Motorcycles, ATVs, and other applications.

T

Transportation Research Center Inc.

10820 State Route 347
East Liberty, OH 43319
United States
www.trcpg.com
207

TRC Inc. specializes in research and development testing services. Brake, crashworthiness, durability, fuel economy, emissions, handling, and performance testing is conducted at the independent automotive proving ground. Facilities include a 7.5 mile (12.1 km) test track, 50-acre (20 hectare) vehicle dynamics area, 9,000 ft. x 84 ft. (2723 x 25 m) skid pad, off-highway area, and crash test facility.

W

Wineman Technology Inc.

1668 Champagne Drive North
Saginaw, MI 48604
United States
www.winemantech.com
306

Wineman Technology specializes in providing technical solutions for solving a wide range of test applications, including solutions for automated testing and data acquisition for the small engine market. Our singular focus is the design and development of test equipment for advanced research and development, functional test labs, and manufacturing production.

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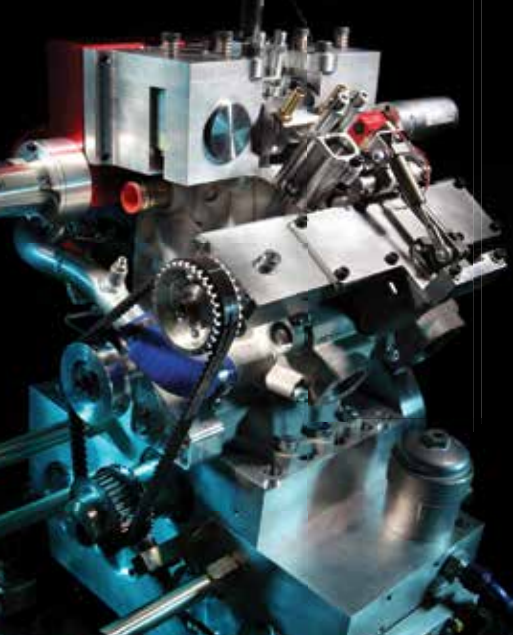
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