SAE 2011 Annual Brake Colloquium And Engineering Display

Technical Session Schedule

As of 09/24/2011 07:40 pm

Sunday, September 18

Environmental Issues

Session Code: ***BC100***

Room Salon DE ***Session Time:*** ***3:00 p.m.***

Organizers - *Stephen Brown, Samarium L.L.C.; Paul G. Sanders, Michigan Technological Univ.*

Time	Paper No.	Title
3:00 p.m.	***ORAL ONLY***	***Overview of Brake Particulate Emissions*** *Paul Sanders, Michigan Technological Univ.*
3:20 p.m.	***ORAL ONLY***	***Particulate Matter and Public Health: A Summary of Evidence*** *Rashid Shaikh, Health Effects Institute*
3:40 p.m.	***2011-01-2345***	***Measures Development for Brake Dust Emissions with Computational Fluid Dynamics and Particle Imaging Velocimetry*** *Klaus Augsburg, Sebastian Gramstat, Ruediger Horn, Hannes Sachse, Ilmenau Technical Univ*
4:00 p.m.	***ORAL ONLY***	***SAE Brake Materials Environmental Task Force Update*** *Robert Peters, Akebono Corp.*
4:15 p.m.	***ORAL ONLY***	***SAE Materials Analysis Methodology Task Force: Results of Material Analysis Study from Linings Made by Linings Manufacturers and Analyzed by Several Corporate, Independent, and Governmental Laboratories*** *Gregory Vyletel, Meritor Inc.*
4:35 p.m.	***Panel***	***Panel*** ***Panelists -*** *Robert Peters, Akebono Corp.; Paul Sanders, Michigan Technological Univ.; Gregory Vyletel, Meritor Inc.;*

Monday, September 19

Braking for Electric and Hybrids

Session Code: ***BC107***

Room Salon D ***Session Time:*** ***10:40 a.m.***

Braking for Electric and Hybrid vehicles entertains a variety of topics associated with the implementation and performance of brake systems for these emerging vehicle architectures. Regenerative braking, innovative brake components and technologies to support the needs of electric vehicles and design and vehicle system analysis and performance may be discussed in this session.

Organizers - *James Fash, TRW Automotive; Antoine Nehme, Peugeot Citroen Automobiles SA*

Time	Paper No.	Title
10:40 a.m.	***2011-01-2357***	***Brake By Wire Functional Safety Concept Design for ISO/DIS 26262*** *Jae Seung Cheon, Jongsung Kim, Jaehan Jeon, Sang Mok Lee, MOBIS*
11:00 a.m.	***2011-01-2356***	***Development of Smart Booster Brake Systems for Regenerative Brake Cooperative Control*** *Hoon Yeo, Changhoe Koo, Wankyo Jung, Dokun Kim, Jae Seung Cheon, MOBIS*

11:20 a.m.	***2011-01-2358***	***Wheel Optimized Brake Torque at the VE Mechatronic Brake***
		Michael Herbert Putz, Christian Wunsch, John E. Morgan, VE Vienna Engineering
11:40 a.m.	***ORAL ONLY***	***Q&A***
		with all presenters

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00187, and also individually. T purchase visit collections.sae.org

Monday, September 19

Voice of OEM's

Session Code: ***BC503***

Room Salon D ***Session Time:*** ***1:30 p.m.***

The session is to facilitate direct communication from OEMs to their suppliers of tier-1, -2 and -3 in an open forum.

Moderators - *Seong Kwan Rhee*

Panelists - *Paul E. Smith, Chrysler Group LLC; David B. Antanaitis, General Motors Company; Antoine Nehme, Peugeot Citroen Automobiles SA; Charles K. Evans, Ford Motor Co.;*

Monday, September 19

Friction-Induced Vibration and Effects of Vibration on Friction

Session Code: ***BC102***

Room Salon D ***Session Time:*** ***3:30 p.m.***

The session facilitates discussions on friction-induced vibrations and the complex interactions at the friction interface. It equally deals with the fundamentals of friction with a particular focus on empirical investigations.

Organizers - *Harald Abendroth, Consultant; Mark Riefe, General Motors LLC*

Time	***Paper No.***	***Title***
3:30 p.m.	***2011-01-2359***	***Measuring System Approach to Analyze Brake Squeal Triggering Mechanism***
		Daniel Wallner, Stefan Bernsteiner, Graz University of Technology
3:50 p.m.	***2011-01-2361***	***Influence of In-Plane and Out-of-Plane Ultrasonic Oscillations on Sliding Friction***
		Elena Teidelt, Valentin Popov, Jasminka Starcevic, Technical University Berlin
4:10 p.m.	***2011-01-2360***	***Influence of Heterogeneous Contact between Disc and Pad on the Brake Squeal Noise***
		Vincent Magnier, Jean-Francois Brunel, Martin Duboc, Philippe Dufrenoy, Univ. Lille Nord de France

4:30 p.m.	***ORAL ONLY***	***Keynote - Friction and Vibration Mechanisms and Pros/Cons of Modeling Various Models***
		Since the time of ancient Egyptians, man has worked to conquer the resistive forces Early investigators such as DaVinci, Amonton and Coulomb laid the foundation of understanding friction which led to the commonly known Coulomb¿s law of friction (, the friction force is proportional to the normal force), which has evolved into the mode tribology. Yet after many centuries and innumerable researchers and papers, the cu of knowledge still distills down to that arcane law. Much of the work has involved co with empirical formulae for the proportionality constant (aka μ) with respect to the diff operating conditions (e.g. velocity, temperature, load etc.), yet this hasn¿t necessaril increased understanding of the underlying mechanisms. If the purpose of gaining an understanding of friction (as with any physical phenomena) is to be able to dominate say we truly say we have such an understanding? The continued prevalence of fricti generated problems (e.g. brake squeal) would suggest not. The next question is the haven¿t arrived at a mastery of friction after all this time using the conventional parad we expect to master it anytime soon? What is the missing link to fulfill our understan even if we can¿t arrive at a fundamental physics understanding, is there hope that w at least arrive at a sufficient ¿engineering¿ understanding to be able manipulate it en solve our problems?
		Todd Rook, Goodrich
4:50 p.m.	***ORAL ONLY***	***Session Wrap-Up and Conclusion / Future Direction***
		Seong Rhee; Peter Filip, Southern Illinois Univ. at Carbondale; Georg Ostermeyer, Univ. of Braunschweig

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Monday, September 19

My Brakes Are Better Than Your Brakes! (or maybe not)

Session Code: ***BC500***

Room Salon DE ***Session Time:*** ***8:00 a.m.***

This panel of distinguished experts will explore the parameters they use to characterize brake components and systems. Which characteristics define a "good" or "bad" brake system? How are they measured? How important are they? What do vehicle owners expect from their brake system? Be sure to join us for these informative presentations and discussion and bring your questions!

Moderators - *William Vander Roest, TRW Automotive*

Panelists - *Michael Austin, Car and Driver Magazine; Andrew Bernhard, J D Power and Associates; Andrew Markel, Brake & Front End Magazine; Eugene A. Petersen, Consumer Reports;*

Monday, September 19

Friction Materials and Raw Materials - Part 2 of 2

Session Code: ***BC101***

Room Salon E ***Session Time:*** ***10:40 a.m.***

Organizers - *Charles K. Evans, Ford Motor Co.; Luc Smeets, Lapinus Fibres BV*

Time	***Paper No.***	***Title***
10:40 a.m.	***2011-01-2366***	***Chemical Reaction between Titanate Compounds and Phenolic Resins***
		Emiko Daimon, Kosuke Inada, Yoshinori Yamamoto, John O'Doherty, Otsuka Chemical Co., Ltd.

11:00 a.m.	***ORAL ONLY***	***Application of Elastomeric Nano Particles in Disc Brake Pads***
		Sirjutaratana Covavisaruch, Chulalongkorn University; Meechai Sriwiboon, Asia Brake; Marvin H. Weintraub, MHW, Ltd.
11:20 a.m.	***2011-01-2367***	***The Role of Copper on the Friction and Wear Performance of Automotive Brake Friction Materials***
		Seong Jin Kim, Jae Young Lee, Jai Min Han, Yoon Cheol Kim, Hyun Dal Park, Hyundai Motor Company; Sang Hun Sung, Jung Ju Lee, Jae Haeng Cha, Joong Ho Jo, Sangsin Brake Corporation; Ho Jang, Korea University
11:40 a.m.	***ORAL ONLY***	***Tribological Fingerprinting ¿ Characterization of the Tribological Functionality of Raw Materials in a Friction Bormulation / Brake Pad***
		Petra Severit, Federal-Mogul Friction Products, Ltd.

Monday, September 19

Friction Materials - Part 1 of 2

Session Code: ***BC101***

Room Salon E ***Session Time:*** ***2:30 p.m.***

Organizers - *Peter Filip, Southern Illinois Univ. at Carbondale; Georg Peter Ostermeyer, Univ. Of Braunschweig*

Time	***Paper No.***	***Title***
2:30 p.m.	***2011-01-2368***	***Improved Friction Performance by using Highly Porous, Thermally Stable Particles; Promaxon® -D***
		Luc Smeets, Bart van de Worp, Lapinus Fibres; Karl Stefan Dewald, Promat NV
2:50 p.m.	***ORAL ONLY***	***A Study on Dynamic Stiffness of Brake Pad***
		Koji Sugimoto, Katsuya Okayama, Hiroya Kishimoto, Yukio Nishizawa, ADVICS Co., Ltd.
3:10 p.m.		***BREAK***
3:30 p.m.	~~***2011-01-2346***~~ ***ORAL ONLY***	***Direct Hot-Pressing (DHP) Systems as an Answer to the Challenges in the Field of Sintered Friction Materials***
		Jens Huber, Dr. Fritsch Powder Shaping Technologies
3:50 p.m.	***2011-01-2347***	***Spatially Resolved Temperatures in Inhomogeneous and Continuously Changing Disk Brake Interfaces***
		Kai Bode, Georg-Peter Ostermeyer, TU Braunschweig
4:10 p.m.	***2011-01-2348***	***The Effect of Metal Pickup to the Friction Interfaces***
		Jürgen Lange, TMD Friction; Georg Ostermeyer, Univ Of Braunschweig
4:30 p.m.	***2011-01-2349***	***Evaluation of AL₂O₃, Graphite and Sulphide Effects on MU Behavior in Different Humidity Environments Through Combined Mixture-Environmental DOE***
		Fabrizio Merlo, Umberto Passarelli, Pietro Buonfico, ITT Italia Srl
	2011-01-2350	***Interaction Between Ceramic Matrix Composite and Organic Pad Materials and its Impact on the Friction Performance (Written Only -- No Oral Presentation)***
		Houzheng Wu, Yuan Wang, Loughborough University; David Pindar, Phil Ferdani, Federal- Mogul Corporation

	2011-01-2352	***Model Approach for a Load and Frequency Dependent Stiffness in Friction Materials (Written Only -- No Oral Presentation)***
		Enrique Wegmann, Axel Stenkamp, TMD Friction GmbH

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Tuesday, September 20

NVH - Part 2A

Session Code: ***BC104***

Room Salon D ***Session Time:*** ***10:40 a.m.***

Organizers - *John David Fieldhouse, Consultant; Weiming Liu, Federal-Mogul Friction Products, Ltd.*

Time	***Paper No.***	***Title***
10:40 a.m.	***2011-01-2362***	***Brake Grind Noise Reduction Potential on Vehicle Level - A TPA Study***
		Daniel Riemann, Head acoustics GmbH; Michael Haverkamp, Ford Motor Co of Europe Inc
11:00 a.m.	***ORAL ONLY***	***Classification of Mode for Brake Squeal and Study the Contribution of the Brake Lining***
		Yuji Yadomaru, Nisshinbo Brake Inc.; Takeshi Yamane, Nisshinbo Manufacturing Inc.
11:20 a.m.	***2011-01-2363***	***The Study of Vehicle Structural Characteristics for Creep Groan Noise***
		Kyu Won Yoon, Jae Cheol Lee, Sung Sun Cho, Mando Corp.
11:40 a.m.	***ORAL ONLY***	***Friction Damped Disc Brake Rotor, Paper #2010-01-0077***
		Brent Lowe, Omar Dessouki, Mark Riefe, General Motors LLC

Tuesday, September 20

NVH - Part 2B

Session Code: ***BC104***

Room Salon D ***Session Time:*** ***1:30 p.m.***

Organizers - *Eric Denys, Material Sciences Corporation; John David Fieldhouse, Consultant; Weiming Liu, Federal-Mogul Friction Products, Ltd.*

Time	***Paper No.***	***Title***
1:30 p.m.	***2011-01-2364***	***Reduction of Groan and Grind Noise in Brake Systems***
		Snehasis Ganguly, Kenneth Pastor, Greg Folta, Ravi lanka, Yuri Karpenko, Ford Motor Company
1:50 p.m.	***ORAL ONLY***	***Improving Noise for A Heavy-duty Truck Drum Brake***
		Weiming Liu, Federal-Mogul Friction Products, Ltd.; Gregory Vyletel, Meritor Inc.
2:10 p.m.	***2011-01-2353***	***Experimental Identification of Brake Lining Material Properties Subjected to Combined Static and High Frequency Loading - A Step Towards a Better Prediction of Disc Brake Squeal?***
		Sylwia Agnes Hornig, Utz Von Wagner, Technische Universität Berlin

2:30 p.m.	***ORAL ONLY***	***Q&A***
		with all presenters

Tuesday, September 20

NVH - Part 1

Session Code: ***BC104***

Room Salon D ***Session Time:*** ***3:30 p.m.***

The 1st brake NVH session includes a variety of papers covering the effect of pad wear, pressure distribution, pad boundary conditions and pad stiffness on brake noise. The last paper of this session describes a new approach where components production tolerances are included during the NVH development phase.

Organizers - *Eric Denys, Material Sciences Corporation; Hidetoshi Shimizu, Link Engineering Co.*

Time	***Paper No.***	***Title***
3:30 p.m.	***2011-01-2354***	***Influence of Pad Surface Texture on Disc Brake Squeal***
		Kyoko Kosaka, Yukio Nishizawa, ADVICS Co., Ltd.; Yutaka Kurita, Yasunori Oura, Univ of Shiga Prefecture
3:50 p.m.	***ORAL ONLY***	***Improvement of Brake Squeal by Contact Stabilization***
		Junichi Shima, Hisataka Naito, Ken Tarui, Masanori Inoue, Akebono Brake Industry Co., Ltd.
4:10 p.m.	***2011-01-2365***	***How Do Nonlinearities Influence Brake Squeal?***
		Daniel Hochlenert, Utz Von Wagner, Technische Universität Berlin
4:30 p.m.	***2011-01-2355***	***Effects of Brake Pad Boundary Contact Surfaces on Brake Squeal***
		Christopher Thomas Griffen, Wolverine Advanced Materials
4:50 p.m.	***ORAL ONLY***	***New Caliper NVH Quality Approach***
		Andreas Reitz, Torsten Treyde, Theo Kaster, TRW Automotive

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Tuesday, September 20

Tuesday Opening Keynote and Award Presentations

Session Code: ***BC502***

Room Salon DE ***Session Time:*** ***8:00 a.m.***

Keynote Speakers - *Elizabeth Lane, Associate, Automotive Equity Research, BofA Merrill Lynch Global Research*

Tuesday, September 20

Aftermarket Update

Session Code: ***BC501***

Room Salon DE ***Session Time:*** ***9:00 a.m.***

Moderators - *Roy Eastham, Honeywell Friction Materials*

Panelists - *Jack Cameron, VP, Automotive Aftermarket Suppliers Association & Staff Executive, BMC; Ken Hamann, Executive Director, Brake Standards Association; Patrick T. Healey, President, Friction Materials Standards Institute;*

Tuesday, September 20

Technology/Rotors/Calipers

Session Code: ***BC106***

Room Salon E ***Session Time:*** ***1:30 p.m.***

The session focuses on rotors, calipers and overall brake system technologies. The scope of coverage includes performance enhancements, weight reductions and thermal management by new designs and innovative materials. It is also putting emphasis on the impact of regenerative braking systems on the foundation components.

Organizers - *Scott C. Meyland, Akebono Corp.; Michael Schorn, TMD Friction GmbH*

Time	Paper No.	Title
1:30 p.m.	***2011-01-2380***	***A Study of Parking Brake Cable Efficiency as Affected by Construction Type*** *Paul Stoloff, Chrysler Group LLC*
1:50 p.m.	***ORAL ONLY***	***Production and Testing of Aluminum Metal-Matrix Composite Brake Rotors for High Performance Applications*** *Stephen Midson, The Midson Group; Graham R. Withers, Cyco Systems; Sun Jue, Suzhou Sanji Foundry Equipment Co., Ltd.*
2:10 p.m.	***ORAL ONLY***	***Q&A*** *with all presenters*
3:10 p.m.		***BREAK***
3:30 p.m.	***ORAL ONLY***	***The Benefits of Gray Iron / Ductile Iron Composite Rotor*** *Brian Anderson, Sanluis Rassini International Inc.*
3:50 p.m.	***2011-01-2382***	***Effect of Directional Surface Finish of Brake Discs on Friction Behavior During Running-in*** *Toshikazu Okamura, KIRIU Corp.*
4:10 p.m.	***Panel***	***Current and Future Rotor Technologies for Vehicles with Regenerative Braking Systems*** ***Panelists -*** *Reiner Becker, Fritz Winter Eisengiessere GmbH & Co. KG; Mauricio Gonzalez Rocha, SANLUIS Rassini Frenos; Makoto Ohta, Akebono Brake Corporation; Toshikazu Okamura, KIRIU Corp.; Lonny Rickman, Woodworth Inc.;*
	2011-01-2379	***A Case Study of Reaction Time Reduction of Vehicle Brake System (Written Only -- No Oral Presentation)*** *Anshuman Gupta, Badal G. Bisen, Tata Motors Ltd.*

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Wednesday, September 21

Testing

Session Code: ***BC105*** ***8:00 a.m.***

Room Salon D ***Session Time:***

Organizers - *Jaroslaw Grochowicz, Ford Motor Co.; Richard A. Kaatz, General Motors LLC*

Time	***Paper No.***	***Title***
8:00 a.m.	***2011-01-2374***	***Brake Dynamometer Test Variability Part 2- Description of the Influencing Factors***
		Jaroslaw Grochowicz, Ford Motor Co.; Carlos Agudelo, Link Engineering Co.; Achim Reich, Continental Teves AG & Co. oHG; Karl-Heinz Wollenweber, TRW Automotive; Harald Abendroth, Consultant
8:20 a.m.	***ORAL ONLY***	***Rubbing (Contact) Thermocouple Investigation for Brake Rotor Testing***
		Andrew Nuesser, General Motors LLC
8:40 a.m.	***2011-01-2371***	***A Comprehensive Study of Humidity Effects on Friction, Pad Wear, Disc Wear, DTV, Brake Noise and Physical Properties of Pads***
		Shin Wook Kim, Seong Joo Lee, Byeong Kyu Park, Seong Kwan Rhee, KB Autosys Co Ltd
9:00 a.m.	***ORAL ONLY***	***Evaluation of Thermal Hysteresis in a Friction Material Using a Thermal Analysis: Case Study of Various Vehicle Endurance Test Procedure***
		KeunHyung Cho, Je-Kyun Kim, Chul Ki Min, Mando Corp.
9:20 a.m.	***2011-01-2373***	***Dynamic Friction Measurements, Especially for High Power Applications***
		Georg Peter Ostermeyer, Univ. Of Braunschweig; Nils Perzborn, Tu Braunschweig
9:40 a.m.	***2011-01-2372***	***Investigation of Brake Control Using Test Rig-in-the-Loop Technique***
		Klaus Augsburg, Sebastian Gramstat, Ruediger Horn, Valentin Ivanov, Hannes Sachse, Ilmenau Technical Univ; Barys Shyrokau, Nanyang Technological University
10:00 a.m.	***ORAL ONLY***	***Studies in Brake Friction Material Compressibility***
		Chuck Greening, Greening Testing Laboratories, Inc.; Thomas Flaim, Complex Systems LLC
10:20 a.m.		***BREAK***
10:40 a.m.	***Panel***	***Panel Discussion on Compressibility***
		Brake pad compressibility is a subject that has recently received considerable attenti scrutiny. Compressibility is of interest to manufacturing quality and consistency as we product engineering. Come and hear the current challenges associated with measuri compressibility along with how the data is being used by engineering. Tentative list c below:

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Wednesday, September 21

Brake Corner Assembly/Brake Drag

Session Code: ***BC109***

Room Salon E ***Session Time:*** ***8:00 a.m.***

This session focuses on brake corner integration with special emphasis on factors affecting fuel economy such as residual drag and mass optimization.

Organizers - *David B. Antanaitis, General Motors LLC; Michael L. Silvasi, TRW Automotive*

Time	Paper No.	Title
8:00 a.m.	***ORAL ONLY***	***Measurement Techniques & Procedures for Measuring Brake Drag*** *C. Todd Proctor, TRW Automotive*
8:20 a.m.	***2011-01-2375***	***Development of Low Friction and Light Weight Wheel Hub Units to Reduce Both the Brake Corner Un-Sprung Mass and Vehicle Co2 Emission - Part 2 - Weight Reduction*** *Cengiz Shevket, Paolo Re, SKF; Luca ciulla, SKF Industrie SPA*
8:40 a.m.	***2011-01-2376***	***Adapting On-vehicle Brake Drag Testing to a Bench Dynamometer*** *Bradley Krough, Lorne Dyar, Patrick Bray, Honda R&D Americas Inc.*
9:00 a.m.	***2011-01-2377***	***Brake Drag Fundamentals*** *Alan Backstrom, Romteck*
9:20 a.m.	***2011-01-2378***	***The Influence of Wheel Assembly Non Uniformity on Disc Brake Lateral Runout*** *David B. Antanaitis, General Motors LLC*
9:40 a.m.	***ORAL ONLY***	***Q&A*** *with all presenters*
10:20 a.m.		***BREAK***
10:40 a.m.	***Panel***	***Panel Discussion: The Fuel Efficient Brake Corner - Discussion of Mass and Drag Reduction*** ***Panelists -*** *Alan Backstrom, Romteck; Joseph Mears, Honda R&D Americas Inc.; Scott C. Meyland, Akebono Corp.; Michele Musso, SKF USA Inc.;*

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Wednesday, September 21

Modeling

Session Code: ***BC103***

Room Salon E ***Session Time:*** ***1:30 p.m.***

Organizers - *Theo Kaster, TRW Automotive; Kwangjin M. Lee, Delphi Corp.*

Time	Paper No.	Title
1:30 p.m.	***ORAL ONLY***	***Dynamic Boundary Samples for Robust NVH Design Using Smart Simulation Methods*** *Joachim Noack, Theo Kaster, Greg Roth, TRW Automotive*
1:50 p.m.	***ORAL ONLY***	***New Efficient Simulation Approach for Brake Squeal*** *Greg Roth, Theo Kaster, Joachim Noack, TRW Automotive*
2:30 p.m.	***ORAL ONLY***	***Effective Development of Ventilated Brake Discs*** *Marko Tirovic, Carlos H. Galindo Lopez, Stamatis Angelinas, Cranfield University*

2:50 p.m.	***2011-01-2383***	***Simulative Investigation of Wheel Brakes in Terms of the Anchor Load and Pad Movement***
		Mathias Haag, Junli Fan, Hermann Winner, Technische Universität Darmstadt; Ulrich Ungethuem, Dirk Simon, Continental
	2011-01-2384	***Modeling Drivers' Behavior During Panic Braking for Brake Assist Application, Using Neural Networks and Logistic Regression and a Comparison (Written Only -- No Oral Presentation)***
		Samira Solaymani Roody, Toklan Toos Ind. Mfg Co.