

THE 12TH INTERNATIONAL CONFERENCE ON TURBOCHARGERS AND TURBOCHARGING

Institution of
**MECHANICAL
ENGINEERS**

Combustion Engines and Fuels Group
Conference

17–18 May 2016
The Kia Oval,
Surrey County Cricket Club,
London

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THE 12TH INTERNATIONAL CONFERENCE ON TURBOCHARGERS AND TURBOCHARGING

17-18 May 2016,
The Kia Oval, Surrey County Cricket Club, London



THIS INTERNATIONAL CONFERENCE IS THE NEXT IN THE INSTITUTION'S HIGHLY SUCCESSFUL AND PRESTIGIOUS SERIES, HELD REGULARLY SINCE 1978, ADDRESSING CURRENT AND NOVEL ASPECTS OF TURBOCHARGING SYSTEMS DESIGN, BOOSTING SOLUTIONS FOR ENGINE DOWNSIZING AND IMPROVEMENTS IN EFFICIENCY.

The current emission legislations and environmental trends for **reducing CO₂ and fuel consumption** are the major market forces in the land transport industry. The internal combustion engine is the key product and downsizing, efficiency and economy are the **driving forces in development** for both **spark ignition (SI) and compression ignition (CI)** engines in the passenger car and commercial vehicle applications.

Over 250 experts will come together to:

- Study advances in 1D simulation and validation
- Enhance systems' transient response
- Learn ways to reduce turbine fatigue
- Find out about new methods to improve turbine unsteady flow

MEDIA PARTNERS



DON'T MISS

Exclusive drinks reception and three-course networking dinner after day one.

Limited places available, book your ticket when registering.

KEY TOPICS INCLUDE:

- Novel applications
- Compressor design, matching, interaction, fuel cell applications, plus CFD
- Advanced simulation: 1D, heat transfer and multibody optimisation
- Transient response
- Supercharging, turbocompound, V/G and 2-Stage
- Novel applications: Euro 7, electric assist plus eBoosting and down speeding
- Turbocharger gas stand and novel testing methods
- Materials, housing, burst containment, EGR
- Turbine; unsteady flow
- Turbine design, plus CFD
- Fatigue life
- Bearings, seals and rotodynamic design
- Exhaust waste heat recovery

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PROGRAMME

DAY 1 TUESDAY 17 MAY	
08:30	REGISTRATION AND REFRESHMENTS
09:00	CHAIR'S WELCOME & INTRODUCTION
09:10	KEYNOTE ADDRESS Tomonori Niizato, Senior Chief Engineer, Technology Development Division 3, Automobile R&D Centre, Honda R&D
	SESSION 1A: COMPRESSOR: APPLICATIONS & MATCHING SESSION 1B: GAS STAND & NOVEL TESTING METHODS
09:40	TURBOCHARGER COMPRESSOR MAP ENHANCEMENT FOR HIGHLY EFFICIENT COMBUSTION ENGINES Tobias Czapka, Dirk Hagelstein, Joerg Theobald, Wolfgang Demmelbauer-Ebner, Volkswagen AG, Germany; Joerg Seume, Leibniz Universitaet Hannover, Germany THE E-DRIVE: AN ISENTROPIC COMPRESSOR PERFORMANCE TEST RIG Phillip Parma, Marco Bergmann, BorgWarner Turbo Systems, Germany
10:00	AERODYNAMIC DESIGN OF A HIGH FLOW AND HIGH PRESSURE RATIO CENTRIFUGAL COMPRESSOR FOR A MARINE-USE TURBOCHARGER Chihiro Mikami, Kiwamu Yamada, Tomoki Kawakubo, IHI Corporation, Japan DETERMINE THE ISENTROPIC TURBINE EFFICIENCY DUE TO ADIABATIC MEASUREMENTS, AND THE VALIDATION OF THE CONDITIONS VIA A NEW CRITERION Rainer Zimmermann, Clemens Biet, Roland Baar, Technische Universität Berlin, Germany
	Q&A SESSION WITH MORNING SPEAKERS Q&A SESSION WITH MORNING SPEAKERS
10:50	NETWORKING REFRESHMENT BREAK
	SESSION 2A: COMPRESSOR: FLOW RANGE ENHANCEMENT DESIGN SESSION 2B: GAS STAND & NOVEL TESTING METHODS
11:20	INVESTIGATION OF PERFORMANCE AND FLOW MECHANISM OF A NON-AXISYMMETRIC CASING TREATMENT IN CENTRIFUGAL COMPRESSOR FOR TURBOCHARGERS Baotong Wang, Ryuusuke Numakura, Vehicle Turbocharger Operation, IHI Corporation, Japan; Hideaki Tamaki, Corporate Research & Development, IHI Corporation, Japan AN APPROACH TO TURBINE HOUSING VALIDATION THROUGH THE MEASUREMENT OF RESIDUAL STRESS USING NEUTRON DIFFRACTION AND OPERATIONALLY INDUCED STRESSES USING HIGH TEMPERATURE STRAIN GAUGES Katy Gannon, Kiumars Shoghi, BorgWarner Turbo Systems, United Kingdom; Sue Kilcoyne, The University of Huddersfield, United Kingdom; Thilo Pirling, Institut Laue-Langevin, France; Shu-Yan Zhang, Rutherford Appleton Laboratory, United Kingdom
11:40	GLOBAL OPTIMISATION OF RECIRCULATION FLOW TYPE CASING TREATMENT IN CENTRIFUGAL Daisaku Sakaguchi, Min Thaw Tun, Nagasaki University, Japan; Ryusuke Numakura, Baotong Wang, IHI Corporation, Japan BIDIRECTIONAL FLOW MEASUREMENT BASED ON THE DIFFERENTIAL PRESSURE METHOD FOR SURGE ANALYSIS ON A SMALL CENTRIFUGAL COMPRESSOR Moritz Werner, Roland Baar, Technische Universität Berlin, Germany; Peter Haluska, Ivo Sandor, Continental Automotive GmbH, Germany
12:00	Q&A SESSION WITH MORNING SPEAKERS COMPRESSOR INLET AND OUTLET PIPE LENGTH AND VOLUME, AND THE EFFECTS ON THE CHARACTERISTICS AND LOCATION OF SURGE Michael Whittlesea, Erling Roberts, Cummins Turbo Technologies, United Kingdom
	Q&A SESSION WITH MORNING SPEAKERS
12:40	NETWORKING LUNCH

PROGRAMME

	SESSION 3A: SUPERCHARGING, TURBOCOMPOUND, V/G & 2-STAGE	SESSION 3B: COMPRESSOR: SURGE LINE MEASUREMENT AND INTERACTION
13:50	AXIAL GROOVE CASING TREATMENT IN AN AUTOMOTIVE TURBOCHARGER CENTRIFUGAL COMPRESSOR Peter Harley, Andre Starke, Takahiro Bamba, Dietmar Filsinger, IHI Charging Systems International GmbH, Germany	EXPERIMENTAL INVESTIGATION OF UPSTREAM INSTALLATION EFFECTS ON THE TURBOCHARGER COMPRESSOR MAP Bertrand Kerres, Andreas Cronhjort, Department of Machine Design, KTH Royal Institute of Technology, Sweden; Mihai Mihaescu, Department of Mechanics, KTH Royal Institute of Technology, Sweden
14:10	ULTRA-HIGH EFFICIENCY SERIAL TWO STAGE TURBOCHARGING SYSTEM FOR MAXIMUM ENGINE EFFICIENCY Rob Cadle, Dietmar Giebert, Ashraf Mohamed, Ronren Gu, Matthew Oakes, Honeywell International, United States of America	INFLUENCE OF THE PIPING SYSTEM ON THE SURGE LINE OF A SMALL CENTRIFUGAL COMPRESSOR FOR AUTOMOTIVE APPLICATIONS Christoph Schäfer, Ivo Sandor, Michael Klaus, Continental Automotive GmbH, Germany; Roland Baar, Technische Universität Berlin, Germany
14:30	VTG TURBOCHARGER EVOLUTION OF BORGWARNER TURBO SYSTEMS Ralf Christmann, Ralf Kopietz, Nico Buhl, Hermann Breithbach, BorgWarner Turbo Systems, Germany	
	Q&A SESSION WITH AFTERNOON SPEAKERS	Q&A SESSION WITH AFTERNOON SPEAKERS
15:10	NETWORKING REFRESHMENT BREAK	
	SESSION 4: ADVANCED SIMULATION	
15:40	OBTAINING BULK FLOW BASED HEAT TRANSFER COEFFICIENTS FOR THERMAL Aliihsan Karamavruc, Borg Warner, United States of America	
16:00	THE EFFECT OF DIFFERENT NOZZLE CLEARANCE AT HUB AND SHROUD SIDE ON VARIABLE NOZZLE TURBINE PERFORMANCE Xin Shi, Sinan Guo, Ben Zhao, Ce Yang and Chaochen Ma, Beijing Institute of Technology, China (PRC)	
16:20	Q&A SESSION WITH AFTERNOON SPEAKERS	
16:50	CHAIR'S CLOSING REMARKS	
17:00	CLOSE OF DAY 1	
19:00	CONFERENCE DRINKS RECEPTION AND NETWORKING DINNER Join speakers and industry for an exclusive networking opportunity and a three course dinner with wine. <ul style="list-style-type: none"> • Booking required. See booking form or visit www.imeche.org/turbo. • Places offered on a first-come first-serve basis. 	

DAY 2	WEDNESDAY 18 MAY	
08:30	REGISTRATION AND REFRESHMENTS	
09:00	CHAIR'S OPENING REMARKS	
09:10	KEYNOTE ADDRESS Heijo Ölschlegel, Daimler AG	
	SESSION 5A: TURBINE; UNSTEADY FLOW	SESSION 5B: MATERIALS, HOUSING, BURST CONTAINMENT, EGR AND FATIGUE LIFE

PROGRAMME

09:50	THE DEVELOPMENT OF A NOVEL UNSTEADY FLOW CONTROL METHOD: CONTROLLING THE ROTATING NOZZLE RING Kun Cao, Peter Newton, Flora Harminder, Ricard Martinez-Botas, Mechanical Engineering, Imperial College London, United Kingdom	EXPLICIT DYNAMIC FINITE ELEMENT SIMULATION OF TURBOCHARGER CONTAINMENT AND WHEEL BURST Lin Wang, Mike Eastwood, Cummins Turbo Technologies, United Kingdom
10:10	DUAL VOLUTE TURBOCHARGER - THE NEXT GENERATION OF PULSE OPTIMISED TURBINES FOR AUTOMOTIVE APPLICATIONS Marc Gugau, Tom Heuer, Sascha Weiske, Rolf Sauerstein, Ferdinand Winkler, BorgWarner Turbo Systems Engineering GmbH, Germany	AN IMPROVED APPROACH TO HCF DEVELOPMENT FOR VANELESS TURBINE STAGES Christopher Wilkins, William Smith, Durga Gouravaraju, Wagner Magalhaes, Zdenek Neterda, Honeywell Turbo Technologies, United States of America
10:30	ANALYSES OF FLOW STRUCTURES OF A TWIN-ENTRY VOLUTE UNDER PULSATILE FLOWS CONDITIONS Cerdoun Mahfoudh, Ecole Militaire Polytechnique, Algeria; Ghenaïet Adel, Faculty of Mechanical and Process Engineering, University of Sciences and Technology, Algeria	THE DEVELOPMENT OF A LONG ROUTE EGR TURBOCHARGER FOR COMMERCIAL ENGINE APPLICATIONS Michael Burkinshaw, Cummins Turbo Technologies, United Kingdom
	Q&A SESSION WITH MORNING SPEAKERS	Q&A SESSION WITH MORNING SPEAKERS
11:10	NETWORKING REFRESHMENT BREAK	
	SESSION 6A - BEARINGS, SEALS & ROTORDYNAMIC DESIGN	SESSION 6B: MATERIALS, HOUSING, BURST CONTAINMENT, EGR AND FATIGUE LIFE
11:40	DESIGN OF A TURBINE-GENERATOR-UNIT FOR AUTOMOBILE ORC APPLICATION Harald Kunte, Joerg Seume, Leibniz Universitaet Hannover, Germany	DEVELOPMENT OF A HIGH TEMPERATURE TURBOCHARGER FOR HEAVY DUTY APPLICATIONS Andrew Sullivan, Mike Eastwood, David Brown, Cummins Turbo Technologies, United Kingdom
	Q&A SESSION WITH MORNING SPEAKERS	Q&A SESSION WITH MORNING SPEAKERS
12:30	NETWORKING LUNCH	
	SESSION 7A - BEARINGS, SEALS & ROTORDYNAMIC DESIGN	SESSION 7B: NOVEL APPLICATION: EURO 7 & ELECTRIC ASSIST PLUS EBOOSTING & DOWN SPEEDING
13:30	HEAT FLOW IN A TURBOCHARGER SHAFT AND ITS IMPACT ON THE BEARING SYSTEM Thorsten Kleine, Henning Rätz, Joerg Seume, Institute for Turbomachinery and Fluid-Dynamics, Leibniz Universitaet Hannover, Germany; Nils Lübbert, Aerezener Maschinenfabrik GmbH, Germany	LOW INERTIA CENTRIFUGAL COMPRESSOR WHEELS: INFLUENCE OF BACKSIDE CAVITY ON AERODYNAMIC LOSSES AND AXIAL FORCES Tore Fischer, Henning Raetz, Melf Peters, Joerg Seume; Institute of Turbomachinery and Fluid Dynamics, Leibniz Universitaet Hannover, Germany
13:50	EXPERIMENTAL AND NUMERICAL ANALYSIS OF SEALING RING OF A TURBOCHARGER Chaochen Ma, Zhi Huang, Jin Bo, Hong Zhang, Beijing Institute of Technology, China (PRC)	ELECTRICALLY ASSISTED TURBOCHARGER OPTIMISATION FOR A HEAVY DUTY DIESEL ENGINE Ahmed Rezk, Martin Jupp, University of Huddersfield, United Kingdom; Jeff Carter, BorgWarner Turbo Systems, United Kingdom
14:10	THE EFFECT OF OIL FILM INSTABILITY ON POWER LOSSES PREDICTION OF TURBOCHARGER ROTOR-FULLY FLOATING RING BEARING SYSTEM Liang Tian, Matthew Wakelin, Craig Lancaster, Martin Lindsay, Cummins Turbo Technologies, United Kingdom	Q&A SESSION WITH AFTERNOON SPEAKERS

PROGRAMME

14:30	Q&A SESSION WITH AFTERNOON SPEAKERS	
14:50	NETWORKING REFRESHMENT BREAK	
	SESSION 8A: EXHAUST WASTE HEAT RECOVERY	SESSION 8B: NOVEL APPLICATION: EURO 7 & ELECTRIC ASSIST PLUS EBOOSTING & DOWN SPEEDING
15:20	A ROBUST AND VALID METHOD OF GAS FOIL BEARING PARAMETERS ESTIMATION: A MODEL ANCHORED ON EXPERIMENTAL DATA Robert Hoffmann, Oliver Munz, Enrico Barth, Tomasz Pronobis, Robert Liebich, Technische Universität Berlin	DESIGN OF COMPRESSOR FOR ELECTRICALLY DECOUPLED TURBOCHARGER IN DOWNSIZED GASOLINE ENGINE BY 3D INVERSE DESIGN Irfan Ghazaly, Mehrdad Zangeneh, University College London, United Kingdom
15:40	EVALUATION METHOD OF THE EXHAUST SYSTEM OF THE TURBOCHARGED DIESEL ENGINE BASED ON EXERGY AND ENTHALPY ANALYSES Chaochen Ma, School of Mechanical Engineering, Beijing Institute of Technology, China; Liwei Sun, School of Mechanical Engineering, Beijing Institute of Technology, China and Automotive Engineering Institute, China; Na Fang, Dongfeng Automotive Engineering Research Institute Technical Centre, China	A COMPARISON OF DIFFERENT HIGH-SPEED ELECTRICAL MACHINE TOPOLOGIES DESIGNED FOR AN ELECTRICALLY ASSISTED TURBOCHARGER Mahir Al-Ani, Martin Jupp, University of Huddersfield, United Kingdom; Jeff Carter, BorgWarner Turbo Systems, Bradford, United Kingdom
16:00	Q&A SESSION WITH AFTERNOON SPEAKERS	PERFORMANCE TESTING OF AN ELECTRICALLY ASSISTED TURBOCHARGER ON A HEAVY DUTY DIESEL ENGINE Edward Winward, Richard Stobart, Dezong Zhao, Zhijia Yang, Loughborough University, United Kingdom; John Rutledge, Caterpillar Inc, United Kingdom; Jeff Carter, BorgWarner Turbo Systems, United Kingdom; Aaron Costall, Imperial College London, United Kingdom
16:20		Q&A SESSION WITH AFTERNOON SPEAKERS
16:50	CLOSING REMARKS	
17:00	CLOSE OF CONFERENCE	

For the most up-to-date and detailed programme for the event, please visit www.imeche.org/turbo

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

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BOOKING FORM

EVENT CODE: C6231

EARLY BIRD ENDS
18 MARCH 2016

THE 12TH INTERNATIONAL
CONFERENCE ON TURBOCHARGERS
AND TURBOCHARGING

17-18 May 2016, The Kia Oval, London
www.imeche.org/turbo

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Do you have any special requirements?	

FEES AND CHARGES Please complete the appropriate box.

Registration fees include entry to the sessions, refreshments, lunch on both days and a copy of the event proceedings.

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Member, IMechE/ Supporting Organisation. Conference only	£590.00 + VAT	£650.00 + VAT	£
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Non-member. Conference only	£710.00 + VAT	£830.00 + VAT	£
Student/Retired. Conference and Dinner	£300.00 + VAT	£345.00 + VAT	£
Student/Retired. Conference only	£230.00 + VAT	£275.00 + VAT	£
Presenting author. Conference and Dinner	£460.00 + VAT	£500.00 + VAT	£
Presenting author. Conference only	£390.00 + VAT	£430.00 + VAT	£

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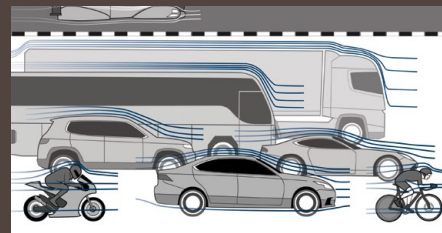
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