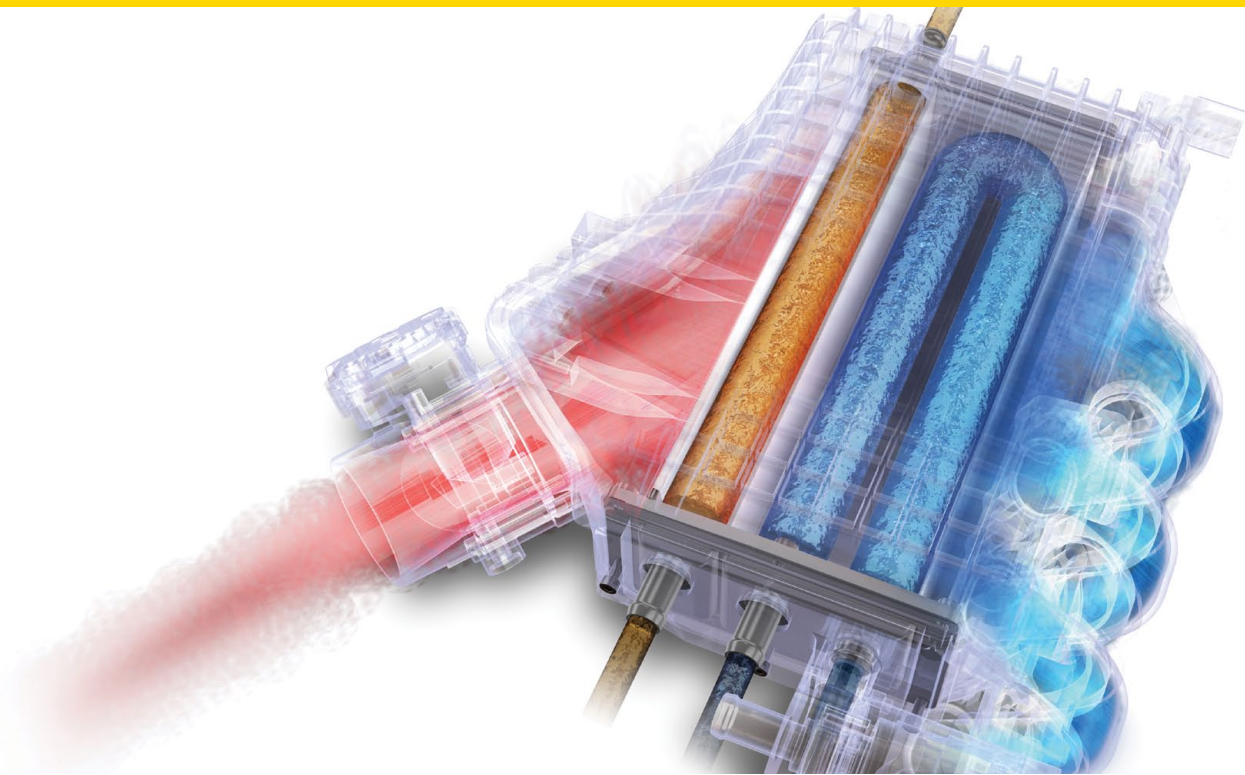


VTMS 12 VEHICLE THERMAL MANAGEMENT SYSTEMS CONFERENCE AND EXHIBITION

Institution of
**MECHANICAL
ENGINEERS**

10-13 May 2015
East Midlands Conference Centre, Nottingham
www.imeche.org/VTMS

CEFG/Automobile Division
Conference



EXHIBITORS:

Aleris

ANSYS

Exa

GT  **Gamma
Technologies**

KULI software
ENERGY MANAGEMENT OPTIMIZATION

ThermoAnalytics

DINNER SPONSOR:



VTMS 12

10-13 May 2015, East Midlands Conference Centre, Nottingham



VTMS 12 WILL COVER THE LATEST RESEARCH AND TECHNOLOGICAL ADVANCES IN THE FIELD OF HEAT TRANSFER, ENERGY MANAGEMENT, THERMAL COMFORT AND THE EFFICIENT INTEGRATION AND CONTROL OF ALL THERMAL SYSTEMS WITHIN THE VEHICLE.

BENEFITS OF ATTENDANCE:

- **Hear** the latest developments in research on heat exchangers and components
- **Understand** the new trends and associated challenges for manufacturing
- **Study** powertrain thermal management for IC, HEV and EV engines
- **Consider** thermal management for the entire vehicle, including heating and cooling systems as well as air flow management
- **Network** with thought-leaders and companies at the forefront of VTMS technology

EVENT PARTNERS:



ORGANISING COMMITTEE:

Darren Butler (Chair), Nissan
David Bridge, MIRA
Jon Caine, Ford Motor Company
Richard Davies, Calsonic Technology Centre Europe
Bernd Grûenwald, MAHLE Behr
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Morgan Heikal, University of Brighton
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Clive Hughes, Tata Motors European Technical Centre
Steve Jones, Bentley Motors
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Cedric Rouaud, Ricardo
Paul Shayler, University of Nottingham
Chris Wheelans, Jaguar Land Rover
Peter White, Coventry University
Ben Wicksteed, Jaguar Land Rover

VTMS 12 EXHIBITION & SPONSORSHIP

There will be an exhibition supporting the conference, which delegates will be free to attend throughout Monday to Wednesday, plus the welcome reception on Sunday evening. There is also an exhibition reception on Monday evening for which delegates can purchase tickets.

EXHIBITORS INCLUDE:



SPEAKERS AND CONTRIBUTORS



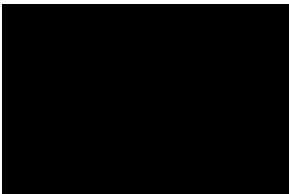
**DARREN BUTLER CONFERENCE CHAIR
MANAGER, CLIMATE SYSTEM DESIGN, NISSAN TECHNICAL CENTRE EUROPE**

Darren Butler began his career at Ricardo Consulting Engineers in the field of powertrain thermal and structural analysis. Following a move to the Research Group for Thermal Analysis, he was appointed Senior Project Engineer for Powertrain Thermal Systems in 1997, and went on to lead the Vehicle Thermal Management Systems group at Ricardo Vehicle Engineering from 2001. During his career, Darren has worked on a wide variety of thermal management projects, including published research for new vehicle thermal simulation methods to support shorter development lead times, and an advanced cooling system for reduced fuel consumption.



**DR SIMON EDWARDS KEYNOTE SPEAKER
GLOBAL DIRECTOR, RICARDO**

Simon Edwards worked for Leyland DAF Trucks. He was employed in the Advanced Technology department, undertaking vehicle aerodynamics and engine friction reduction activities. From 1993 to 2006 he worked for Ricardo, on engine development and research projects, firstly in the UK and latterly, after a UK Royal Academy of Engineering fellowship with DaimlerChrysler, in Stuttgart, Germany. In July 2012, Simon rejoined Ricardo and is currently Global Technology Director, responsible for the research and collaboration portfolio of the company. He also has a role in the senior leadership team of Ricardo Deutschland.



**DR BOB JOYCE AFTER-DINNER SPEAKER
EXECUTIVE DIRECTOR, PRODUCT CREATION AND DELIVERY,
JAGUAR LAND ROVER**

Bob Joyce has over 35 years of experience, which began at Ricardo Consulting, leading the development of 6/8/12/16 cylinder engines called the F Series. Bob joined Rover in 1991 and was responsible for the design and development of Rover's innovative new K series engine. Following the sale of Rover, Bob was recruited by Ford Motor Company to become Engineering Director – Land Rover. In 2007, under Tata ownership, Bob became Group Engineering Director responsible for the UK's third largest engineering team.

RESEARCH FORUM PANEL:



**DR ANTHONY BAXENDALE
MANAGER FOR FUTURE TRANSPORT TECHNOLOGIES AND RESEARCH, MIRA**

Anthony Baxendale joined MIRA in 1991 after five years at the Aircraft Research Association. From 1997 to 2004 he was responsible for MIRA's Fluids Engineering department. Since 2004 he has been MIRA's Research Manager, responsible for MIRA's future transport technology strategy and the operational management and development of the programme to deliver this. The key themes of this programme are low-carbon vehicle technologies, intelligent mobility technologies and autonomous ground vehicle technologies.



**DR ANDREAS EILEMANN
ADVANCED ENGINEERING, LIGHT VEHICLE, MAHLE BEHR**

Andreas Eilemann studied Physics at the Universities of Düsseldorf and Göttingen in Germany, receiving his PhD in Physics from Göttingen University with a thesis in Psychological Acoustics. Joining Behr in 1995, he worked in different functions within Advanced Engineering Air Conditioning, before three years as Chief Engineer Air Conditioning at Behr America in Michigan, USA. After his return he took responsibility for development of heat exchangers. Since 2009, Andreas has been responsible for Pre-Development Engine Cooling Light Vehicles within the business unit, Thermal Management of Mahle.



**PROFESSOR DAVID GREENWOOD
ADVANCED PROPULSION SYSTEMS, WMG, UNIVERSITY OF WARWICK**

David Greenwood is Professor of Advanced Propulsion Systems at WMG, University of Warwick, where he is responsible for powertrain research activities with a particular focus on the automotive industries. David joined WMG in 2014 with over 20 years' industrial experience in new technology development for the automotive and related industries. Following university, he joined engineering consultancy Ricardo UK, where he stayed for over 20 years. Beginning work as a technical software writer, David then worked in Powertrain and Vehicle research, and then led the Vehicle Thermal Management department before moving back into an Advanced Technology role as UK Product Group Head, finally running the UK Hybrid and Electric Systems business.

CONFERENCE OVERVIEW

MONDAY 11 MAY 2015	
09.30-10.00	Opening Ceremony
10.00-10.30	Keynote Address
10.30-11.00	Networking Refreshments & Exhibition
11.00-12.30	Session 1A: Heat Exchange I Session 1B: Alternative Powertrain
12.30-14.00	Networking Lunch & Exhibition
14.00-15.30	Session 2A: Heat Exchange II Session 2B: Engines
15.30-16.00	Networking Refreshments & Exhibition
16.00-17.30	Session 3: Simulation/Energy Management I

TUESDAY 12 MAY 2015	
09.30-10.30	Session 4A: Waste Session 4B: Heat & A/C I
10.30-11.00	Networking Refreshments & Exhibition
11.00-12.30	Session 5A: Heat Exchange III Session 5B: Simulation/Energy Management II
12.30-14.00	Networking Lunch & Exhibition
14.00-15.30	Session 6A: Heat Exchange IV Session 6B: Waste
15.30-16.00	Networking Refreshments & Exhibition
16.00-17.30	Research Forum Panel

WEDNESDAY 13 MAY 2015	
09.00-10.30	Session 7A: Underhood & Simulation I Session 7B: Heat & A/C II
10.30-11.00	Networking Refreshments & Exhibition
11.00-12.30	Session 8A: Heat Exchange V Session 8B: Underhood & Simulation II
12.30-14.00	Networking Lunch & Exhibition
14.00-15.30	Session 9A: Heat Exchange VI Session 9B: Simulation/Energy Management III
15.30-16.00	Networking Refreshments & Exhibition
16.00-16.30	Closing Ceremony & Awards

PROGRAMME

SUNDAY 10 MAY 2015

17.00-19.00

Welcome Exhibition Reception

Please indicate if you would like to attend the welcome reception on the booking form at the back of this brochure.

MONDAY 11 MAY 2015

09.30

Opening Ceremony

10.00

Keynote Address

Dr Simon Edwards, Global Director, Ricardo

10.30

Networking Refreshments & Exhibition

11.00-12.30

SESSION 1A: HEAT EXCHANGE I

Optimising the Cost of Thermal Management Components by Using High-Performance Engineering Polymer (HPEP)

M Wright, Solvay Specialty Polymers, UK

High-Temperature Polyamides: the Latest Developments for High-Temperature Applications

E Spini, Radici Plastics, Italy

Plastic Material Development for Lightweight Exchanger and Climate Control Parts

P Havet, A Tanghe, Valeo Thermal Systems – Powertrain Thermal Systems, France

11.00-12.30

SESSION 1B: ALTERNATIVE POWERTRAIN

Efficient and Integrated Thermal Management for Electric Vehicles

B Jiang, HVACR & Heat Transfer Research Group, University of Nottingham, UK & Hefei University of Technology, China; Q Wang, Y Yana, HVACR & Heat Transfer Research Group, University of Nottingham, UK

Battery Thermal Management System Analysis and Improvement Methods for HEV

W Xihui, South China University of Technology, China & The University of Nottingham, UK; Zhengxiao, Y Yan, The University of Nottingham, UK

Improving Electric Vehicle Energy Efficiency with Co-Simulation of Cooling System, HVAC System and Electric Drivetrain

D Dvorak, Austrian Institute of Technology, Austria; C Rathberger, A Lichtenberger, MAGNA, Engineering Centre Steyr, Austria

12.30

Networking Lunch & Exhibition

14.00-15.30

SESSION 2A: HEAT EXCHANGE II

Taking the Best of Polyamide Engineering Materials for Cooling and Air Intake Systems Components

T Landmeters, Toyota Motors Europe, Belgium; N Delon-Anik, Solvay Research and Innovation, France; A Guiu, Solvay Engineering Plastics, France

High-Heat Resistant Polyamides for the Air Intake System

M Hoffmann, O Thomas, A Bayer, B Hoffmann, EMS-CHEMIE, Switzerland

Plastic Material Development for New Charge Air Cooler Exchanger in the Low-Pressure Exhaust Gas Recirculation Loop

Z Ahmed, G Cairnie, M Ndiaye, J Rodriguez, A Sankar, AVL Powertrain, UK

14.00-15.30

SESSION 2B: ENGINES

The Split-Cycle Engine and Its Impact on the Vehicle Cooling System

RE Morgan, G Dong, MR Heikal, Centre for Automotive Engineering, University of Brighton, UK

A New Approach to Investigating Engine Thermal Management Using a Bespoke Design of Four-Cylinder Engine

R Gardiner, C Zhao, J Addison, P Shayler, University of Nottingham, UK; I Pegg, R Stark, Ford Motor Company, UK; R Gilchrist, Jaguar Land Rover, UK

Development of a High-Efficiency Liquid-Air Engine For Cooling, Heat Recovery and Power

N Owen, H Clarke, Dearman Engine Company; D Charters, MIRA, UK; J Trembley, Air Products, UK; C Garner, S Mohr, A Williams, H Zhao, Loughborough University, UK

15.30

Networking Refreshments & Exhibition

16.00-17.30

SESSION 3: SIMULATION/ENERGY MANAGEMENT I

Thermal Gasoline Concept Vehicle, Simulation and Control

X Liu, R Rastelli, BorgWarner, USA

Assessment of the Benefits from an Electric Coolant Pump by Means of Dual Numerical Simulations, Comprising a Model of the Thermal System Coupled with the Model of a Plug-In Hybrid Concept

E Andrés, V Mazet, S Bruck, Renault SAS, Alliance Systems Engineering Division, France

Heat Transfer Characteristics of Nanofluid

M Elsebay, I Elbadawy, MH Shedid, Helwan University, Egypt

17.45

Exhibition Reception

Canapés and drinks will be served among the exhibition stands. To reserve a place at the reception please complete the relevant section on the booking form.

TUESDAY 12 MAY 2015

09.30-10.30	SESSION 4A: WASTE
	Modelling and Optimisation of Thermoelectric Generator Systems A Agurto-Goya, Jaguar Land Rover, UK; S Chiwanga, European Thermodynamics, UK; P Shayler, University of Nottingham, UK
	A New Approach for Predicting the Maximum Fuel-Saving Potential of an Automotive Thermoelectric Generator in its Early Development Stage A Bauknecht, M Rexeis, RA Almbauer, Graz University of Technology, Austria
09.30-10.30	SESSION 4B: HEAT & A/C
	Effects of Heated Seats on Thermal Comfort and Heater Energy Consumption in Vehicle H Oi, Nissan Motor Company, Japan; Y Tochiara, Kyushu University, Japan
	Comprehensive Thermal Comfort Assessment Using Simplified Thermoregulatory Bio-Heat Equation within CFD A Dixit, U Gade, A Kandekar, Tata Technologies, India
10:30	Networking Refreshments & Exhibition
11.00-12.30	SESSION 5A: HEAT EXCHANGE III
	Aluminium Heat Exchanger and Brazing – Review and Outlook of Successful Symbiosis M Tuerpe, B Gruenenwald, MAHLE Behr, Germany
	Electrochemical Study of Aluminium Extruded Tubes for Brazed Condenser I Portal, C Casenave, M Wainer, L Aubanel, M Phillippe, V Renault, AG Vilemiane, Valeo Thermal Systems, France
	A Mechanistic Study of Aluminium Brazing Systems DK Hawksworth, Diomedea, Canada; DP Sekulic, University of Kentucky, USA & Harbin Institute of Technology, China; H Fu, University of Kentucky, USA; RA Westergård, Gränges, Sweden
11.00-12.30	SESSION 5B: SIMULATION/ENERGY MANAGEMENT II
	Heavy-Duty Vehicle Cooling System Auxiliary Load Management Control: A Comparison of Advanced Control Strategies S Sermeno, E Bideaux, T Morgan, INSA de Lyon & Renault Trucks SAS, France
	Next Generation of Thermal Management System for 2018 Applications T Singh, R Nolte, A Calamiello, General Motors Engineering, Germany & Italy; C Rouaud, K Heffer, S Porteous, Ricardo, UK
	An Integrated System Approach to Thermal Management on the BorgWarner Thermal Gasoline Concept Vehicle A Sutherland, E Sharpe, X Liu, BorgWarner, USA
12:30-14:00	Networking Lunch & Exhibition
14.00-15.30	SESSION 6A: HEAT EXCHANGE IV
	Reaction Behaviour of Mixtures of Non-Corrosive Flux and Non-Corrosive Flux Containing Zn During Brazing H Kumagai, N Yamashita, UACJ Corporation, Japan
	Recent Work on Low Melting Clad for Heat Exchanger Products A Schlegel, B Jacoby, S Kirkham, A Buerger, Aleris Rolled Products, Germany
14.00-15.30	SESSION 6B: WASTE
	Electrical Heat-Assisted Lean NOx Trap System for NOx Emissions Reduction in Diesel Engines Z Ahmed, G Cairnie, M Ndiaye, J Rodriguez, A Sankar, AVL Powertrain, UK
	A Novel Working Fluid for Organic Rankine Cycle (ORC) AS Panesar, RE Morgan and MR Heikal, Centre for Automotive Engineering, University of Brighton, UK
15.30	Networking Refreshments & Exhibition
16.00	Research Forum Panel Discussion: Thermal Management for the 2020s: Challenges, Opportunities and Hanging Requirements Panellists: David Skipp, Manager, UK Technical Strategy & Business Office, Research & Advanced Engineering, Ford, UK; Prof David Greenwood, Advanced Propulsion Systems, University of Warwick, UK; Dr Anthony Baxendale, Manager for Future Transport Technologies and Research, MIRA, UK; Dr Andreas Eilemann, Advanced Engineering, Light Vehicle, MAHLE Behr, Germany
17.30	Close of Technical Session
18.30	Conference Dinner: Nottingham Castle After-Dinner Speaker Dr Bob Joyce, Executive Director, Product Creation and Delivery, Jaguar Land Rover, UK Sponsored by Dana Please note places at the dinner are limited and will be reserved for delegates on a first come first served basis. Please complete the relevant section on the booking form.
	DINNER SPONSOR: 

WEDNESDAY 13 MAY 2015**SESSION 7A: UNDERHOOD & SIMULATION I**

09.00-10.30

Drive Cycle Simulation of a Tiered Cooling Pack Using Non-Uniform Boundary Conditions
W Jansen, Jaguar Land Rover, UK**Cooling Airflow Virtual Component Characterisation**
D Wellman, S Wakelam, Jaguar Land Rover Thermal and Aerodynamic Systems Engineering & EXA, UK**Predicting Cooling System Transient Performance Utilising 3D Simulation and a Simplified Cooling Package and Powertrain System Model**
A Price, Bentley Motors, UK; E Tate, Z Yang, Exa Corporation, USA; V Staelens, Exa Corporation, UK**SESSION 7B: HEAT & A/C II**

09.00-10.30

Prediction of Vehicle Interior Warm-Up and Cool-Down using CAE Techniques
KS Sandhu, Jaguar Land Rover, UK**Simulative Comparison of Conventional and Secondary Loop Automotive Refrigeration Systems**
JC Menken, JE Koerner, TA Weustenfeld, K Strasser, Audi, Germany; J Koehler, Institute of Thermodynamics, University of Braunschweig, Germany

10:30

Networking Refreshments & Exhibition**SESSION 8A: HEAT EXCHANGE V**

11.00-12.30

Development of Continuous Cast Aluminium Fin Stock for a Smaller, Lighter and More Efficient Radiator
T Kokubo, T Anami, Nippon Light Metal Company, Japan; H Teramoto, S Teshima, T Toyama, Japan**Analysis of Unsteady Flow for Vortex Generator Development for Heat Exchangers**
J Hara, M Iwasaki, Calsonic Kansei, Japan; I Honda, University of Hyogo, Japan**SESSION 8B: UNDERHOOD & SIMULATION II**

11.00-12.30

Simulation Approach for Bumper Integrated Tailpipe Finisher
SK Sivasankaran, W Jansen, Jaguar Land Rover, UK; V Staelens, Exa, France**Dual-Use Heater Core – Increase in Trailer Tow Capacity and Analysis of Control Set-Points with Active Grill Shutters**
S Uppuluri, A Naiknaware, Computational Sciences Experts Group, USA

12:30

Networking Lunch & Exhibition**SESSION 9A: HEAT EXCHANGE VI**

14.00-15.30

Next-Generation Header Materials for Corrosion-Resistant Heat Exchangers
V Sass, G Bermig, H Janssen and S Schlueter, Hydro Aluminium Rolled Products, Germany**Photochemical Etching of Heat Exchanger Components**
M Eesa, G Marriot, Advanced Chemical Etching, UK**SESSION 9B: SIMULATION/ENERGY MANAGEMENT III**

14.00-15.30

Energy Flow Rate Based Thermal Management for Electric Vehicles Using a Secondary Loop Heating and Cooling System
TA Weustenfeld, W Bauer-Kugelmann, JC Menken, K Strasser, AUDI, Germany; J Koehler, Institute of Thermodynamics, University of Braunschweig, Germany**A Process for Battery Thermal Design**
E Tate, J Han, A Velivelli, Z Yang, Exa Corporation, USA; W Jansen, I Hughes, Jaguar Land Rover, UK**Effects of Variable Accelerations on a PHP-based cooling system**
M Manzoni, M Marnelli, University of Bergamo, Italy; M Marengo, University of Bergamo, Italy & University of Brighton, UK; C de Falco, L Areneo, Politecnico di Milano, Italy; S Filippeschi, University of Pisa, Italy

15.30

Networking Refreshments & Exhibition**THURSDAY 14 MAY 2015**

10.00-12.00

Technical Visit to Rolls Royce Heritage Trust

The Rolls-Royce Heritage Trust exhibition houses an extensive collection at our Light Alloy Foundry (LAF) site on Osmaston Road, where you can see the largest collection of aero engines in the country, ranging from World War I era piston engines, the famous Merlin, up to modern day jet engines. The collection also includes examples across Rolls-Royce's product range including marine and industrial applications. To reserve a place please complete the relevant section on the booking form.

Find out more about our speakers at www.imeche.org/VTMS

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

BOOKING FORM

EVENT CODE: C1400AB

VTMS 12

10-13 May 2015
East Midlands Conference Centre, Beeston Lane, The University of Nottingham, Nottingham NG7 2RJ

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

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Member, Institution of Mechanical Engineers	£660.00	£132.00	£
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Presenting Author	£440.00	£88.00	£
Conference Dinner - Attendee	£60.00	£12.00	£
Welcome Exhibition Reception	£20.00	£4.00	£
Technical Visit to Rolls-Royce Heritage Centre:	£25.00	£5.00	£

Please indicate which sessions you would like to attend:

Monday 11 May Wednesday 13 May Tuesday 12 May
 1A/1B 2A/2B 7A/7B 8A/8B 9A/9B 4A/4B 5A/5B 6A/6B

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Andy Cowell, Managing Director, Mercedes AMG High Performance Powertrains, will explore how to manage a fast-paced, technically advanced organisation and stay in control.

www.imeche.org/events/L6217



16 June 2015
Coventry

BEYOND CONVENTIONAL POWERTRAIN: SVT 2015

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www.imeche.org/events/C6188

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