

DEVELOPMENTS IN TRANSMISSION AND DRIVELINE TECHNOLOGY

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BAE Systems

22 March 2016

Birmingham

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DEVELOPMENTS IN TRANSMISSION AND DRIVELINE TECHNOLOGY

22 March 2016,
Birmingham



AUTOMOTIVE OEMS, TIER 1 AND TIER 2 COMPANIES WILL PRESENT AN ALL-ENCOMPASSING VISUAL OF THE DRIVELINE MARKET TODAY AND FOR THE FUTURE.

Developments in Transmissions and Driveline Technology explores the evolution to have high quality power and control in a vehicle, whilst maintaining optimum fuel economy and efficiency. This unique technical seminar not only addresses transmission and driveline developments for passenger cars, but also advances being made across the industry, on and off highway.

This is an exclusive opportunity for attendees to meet vehicle Original Equipment Manufacturers, key driveline suppliers and the thought leaders furthering technical level research and developments within the industry, to discuss their latest work and question how best to shape the future of the industry.

Key speakers include:

- Jérôme Mortal
Chief Engineer Systems,
Jaguar Land Rover
- Mike Richardson
Chief Technical Specialist,
Jaguar Land Rover
- Julien Maynard
Head of Engineering
for Transmission and Driveline,
Ricardo
- Robert Genway-Haden
Global Product Technology Director,
GKN Driveline
- Adrian Moore
Managing Director,
Xtrac

⊕ ATTEND THIS SEMINAR TO DISCOVER:

- The impact of higher gear ratio on fuel economy
- Challenges faced in the electrification of drivelines and powertrains
- The role of transmission and driveline systems in reducing carbon emissions and improving efficiency
- Adapting to hybridisation and the impact this has on transmission and driveline designs
- Developments made on and off highway, including bus and tractor transmissions and drivelines
- Innovations that ensure better fuel economy without compromising on driveability, power or control
- Ongoing research and development in hybrid and electric vehicle transmissions

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Automobile Division, The Institution of Mechanical Engineers

Members Credits:

Dave Simner
Course Director for Military Vehicle Technology,
Cranfield University

Mike Blundell
Professor of Vehicle Dynamics and Impact, Centre for Mobility and Transport,
Coventry University

Chris Brace
Professor of Automotive Propulsion,
University of Bath

Sam Akehurst
Reader in Advanced Powertrain Systems,
Powertrain & Vehicle Research Centre

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PROGRAMME

22 MARCH 2016

08:30 REGISTRATION AND REFRESHMENTS



09:00 CHAIR'S OPENING REMARKS

Chris Brace, Professor of Automotive Propulsion, University of Bath

Dave Simner, Course Director for the Military Vehicle Technology MSc, Cranfield Defence and Security, Cranfield University

Sam Akehurst, Reader in Advanced Powertrain Systems, Powertrain & Vehicle Research Centre

LEARNING FROM MANUFACTURERS

09:10 KEYNOTE: THE ELECTRIFICATION OF DRIVELINE AND POWERTRAIN TECHNOLOGY AND HIGH EFFICIENT VEHICLES

Jérôme Mortal, Chief Engineer, Jaguar Land Rover

Mike Richardson, Chief Technical Specialist, Jaguar Land Rover

- Addressing Jaguar Land Rover's approach to concerns over CO₂ emissions and future strategies
- Identifying new architecture concepts and innovations core to future vehicle design
- Gaining a technical outlook on electrification and its bearing on international business

09:40 LATEST TECHNOLOGIES – ZF ELECTRIC PORTAL AXLE AVE 130

Peter Rieger, Application Engineer, ZF Friedrichshafen AG

- Suiting new systems to various drive concepts like a serial hybrid, fuel cell or battery
- Increasing performance with the 400V version
- Widening the technology to a system

10:10 PANEL DISCUSSION - IDENTIFYING KEY ENGINEERING QUESTIONS

- What are the main considerations made when selecting design options for transmissions and drivelines?
- Increasing the number of gears – improving driveability or marketing strategy?
- Responding to the emissions crisis – what role do transmission and driveline innovators play?



10:40 NETWORKING REFRESHMENT BREAK

FUEL ECONOMY FOR THE FUTURE

11:10 THE TRANSMISSION AS THE INTEGRATING TECHNOLOGY IN FUTURE VEHICLES

Adrian Moore, Managing Director, Xtrac

- Identifying the specific requirements needed from a transmission for use in a future electric (EV), hybrid (PHEV) or range extender electric vehicle (REEV)
- Discussing the differences of those requirements compared to a more conventional internal combustion (IC) engine vehicle
- Presenting an overview of how transmissions are becoming the key 'integrating technology' in an optimising future for vehicles

11:40 INTEGRATING CUMMINS EURO VI ENGINES FOR OPTIMISED COMMERCIAL VEHICLE FUEL CONSUMPTION AND CARBON EMISSIONS

Stuart Barlow, Lead Engineer, Cummins Engines Ltd

Tarkan Yapici, Lead Engineer, Cummins Darlington Engine Plant

- Minimising fuel consumption in the process of developing a commercial vehicle
- Exploring the role of Cummins Engines in OEM fuel consumption measurement and optimisation
- Understanding best practice for measurement and analysis of fuel consumption data

12:10 EXPLORING RICARDO'S TECHNICAL CONTENT FOR TRANSMISSIONS OF THE FUTURE

Julien Maynard, Head of Engineering for Driveline and Transmission Systems, Ricardo

- Ricardo's view on the automatic transmission roadmap towards 2020
- Dedicated Hybrid Transmission (DHT): the new category of automatic transmissions
- Is there a cost-effective way to power-shift capable automatic transmissions?



12:40 NETWORKING LUNCH

PROGRAMME

22 MARCH 2016 (CONT.)

UNDERSTANDING ON AND OFF HIGHWAY

13:40 **DEVELOPMENTS IN BUS, TRUCK AND OFF HIGHWAY APPLICATIONS**
John Hilton, Deputy Chairman, Torotrak UK

14:10 **DEVELOPING SMART DRIVELINE SOLUTIONS TO OPTIMISE POWER DELIVERY EFFICIENCY IN 4X4 TRACTORS**
Ianto Guy, Head of Off Road Vehicle Design, Harper Adams University

- Exploring the design of traditional four-wheel-drive agricultural tractor systems
- Identifying how the front axle 'lead' has an effect on the efficiency of the vehicle
- Harper Adams University's prototype hybrid 4x4 and researching how the lead can be varied and efficiency can be optimised

14:40 **WHOLE LIFE COST OF DIESEL ELECTRIC HYBRID BUSES**
John Bickerton, Chief Engineer, Reading Buses

- An overview of Reading Buses' diesel electric hybrids, which have been operational for five years
- Fuel consumption, battery life and component durability
- Management and warranty of the whole life cost including engaging with the manufacturer



15:10 **NETWORKING REFRESHMENT BREAK**

AVOIDING COMPROMISE

15:40 **FROM CONVENTIONAL TO ELECTRIC - THE EVOLUTION OF ALL-WHEEL DRIVE (AWD)**
Robert Genway-Haden, Global Product Technology Director, GKN Driveline

- How all-wheel drive systems are evolving to reduce the fuel penalties traditionally associated with the segment
- The growing importance of AWD systems capabilities and systems integration expertise to OEMs
- Hybrid electric vehicles mark the future for all-wheel drive, delivering excellent driving dynamics with new levels of efficiency

16:10 **OGECO, A HYBRIDISED TRANSMISSION OPTIMISED FOR FUEL ECONOMY**
Marco Fracchia, Operations Manager, Vocis Driveline Controls

- Exploring the transmission's role in the balance of efficiency and drivability
- Hybridised power-shifting Automated Manual Transmissions, focused on performance and fuel economy
- Ongoing developments to further improve transmission efficiency

16:40 **PLANETARY MODULE FOR HYBRID AND PLUG-IN HYBRID VEHICLES**
Joern Behrenroth, Managing Director, FEV UK

- Implementing a hybrid transmission with reduced component utilising planetary gear set
- Operating modes and principle application
- Advantages compared to a traditional P2 concept

17:10 **CHAIR'S CLOSING REMARKS**
Chris Brace, Professor of Automotive Propulsion, University of Bath
Dave Simner, Course Director for the Military Vehicle Technology MSc, Cranfield Defence and Security, Cranfield University
Sam Akehurst, Reader in Advanced Powertrain Systems, Powertrain & Vehicle Research Centre

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

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

SPEAKERS AND CONTRIBUTORS

KEYNOTE SPEAKERS



JÉRÔME MORTAL
CHIEF ENGINEER SYSTEMS, JAGUAR LAND ROVER
Jérôme Mortal started his career at Peugeot Research Centre in 1993 as an engineer. He then went to work with Renault Powertrain, Renault F1 and Renault Sport Technologies. In 2006 Jérôme became Chief Engineer of Renault-Dacia Engineering in Romania. In 2012 Jérôme moved to Russia, becoming the Deputy Director of the Mechanical Division at AVTOVAZ before taking his current role at Jaguar Land Rover in 2014 as Chief Engineer, Transmission and Driveline and eMachine and Powertrain Systems.



MIKE RICHARDSON
CHIEF TECHNICAL SPECIALIST, LOW CARBON VEHICLES, JAGUAR LAND ROVER
Mike Richardson is a Chief Engineer with over 30 years' industrial experience. His experience spans research, advanced engineering and product development, with particular emphasis on managing the delivery of high technology features and functions from the research and development environment to mainstream engineering. Since 2006 he has been working in the area of Hybrids, Electrification and Low Carbon Vehicles at Jaguar Land Rover.

CHAIRS



CHRIS BRACE
PROFESSOR OF AUTOMOTIVE PROPULSION, UNIVERSITY OF BATH
Chris Brace is Professor of Automotive Propulsion and Deputy Director of the Powertrain Vehicle Research Centre. He is the immediate past Chair of the Automobile Division of the Institution of Mechanical Engineers (2012-2014) and is member of the Technical Committee of FISITA and Members Council of LowCVP. He has published over 110 conference and journal papers with over 50 industrial co-authors and attracted over £10million for collaborative research funded by EPSRC, DTi, TSB/Innovate UK, APC and directly from industry. Chris leads a wide portfolio of powertrain systems-based research projects including advanced transmission systems.



SAM AKEHURST
READER IN ADVANCED POWERTRAIN SYSTEMS, POWERTRAIN & VEHICLE RESEARCH CENTRE
Sam Akehurst is a Reader in Powertrain Systems and a Chartered Engineer. His research focuses on the performance of future powertrain systems, including advanced diesel and gasoline engine technology, boosting systems and Continuously Variable Transmissions (CVTs). Sam received a BEng in Mechanical Engineering from the University of Bath in 1996. His PhD was awarded in 2001 for a study into the parasitic losses associated with a pushing metal V-belt CVT. He was awarded an EPSRC Advanced Fellowship from 2005-2010 to investigate novel approaches to future vehicle powertrain optimisation. He has published over 90 journal and international conference papers.

SPEAKERS



ADRIAN MOORE
MANAGING DIRECTOR, XTRAC LIMITED
Adrian Moore is a Fellow of the Institution of Mechanical Engineers and a member of the Automobile Division. He is holder of several patents related to transmission technology and regularly presents technical papers at industry conferences. Having worked with industry leaders such as Rolls-Royce, Ferrari and McLaren, Adrian has been an elemental part of Xtrac since 1992. He was appointed Managing Director of Xtrac in 2015.

SPEAKERS AND CONTRIBUTORS

SPEAKERS



IANTO GUY
HEAD OF OFF ROAD VEHICLE DESIGN, HARPER ADAMS UNIVERSITY

Ianto Guy graduated in 2006 as the first student on the Off Road Vehicle Design MEng at Harper Adams University. He completed his PhD, on power flow in four-wheel-drive transmission systems and the effect that behaviour has on vehicle efficiency, in 2011. He was appointed Head of Automotive Engineering (Off-Highway), at Harper Adams University in 2011. His primary role is teaching and developing new courses, but he is still involved in research into 4x4 transmission behaviour and vehicle mobility prediction. He is also a Paramedic with the Welsh Ambulance Service.



JOHN BICKERTON
CHIEF ENGINEER, READING BUSES

John Bickerton graduated from the University of Bath with MEng (Hons) in Automotive Engineering. After experience with Cosworth and Lotus he joined the country's largest bus operator, First, as a graduate trainee, and spent time in front-line management positions before managing the company's fuel saving strategy and eventually leading the company's technical standards nationally. After 12 years with First, John has recently moved to Reading Buses as Chief Engineer, where he is focused on building fleet reliability and controlling maintenance costs.



JON HILTON
PRODUCT DEVELOPMENT AND SALES DIRECTOR, TOROTRAK PLC

Jon Hilton started his engineering career at Rolls-Royce where he designed gas turbine engines for helicopters. A 15-year career in Formula One followed, culminating in the role of Technical Director Engine Division at the Renault F1 team. In January 2007, Jon started Flybrid Automotive to develop high-speed flywheel-based kinetic energy recovery systems. In January 2014 Torotrak PLC acquired Flybrid Automotive and Jon was retained in a Board Director role. Jon is a Vice President of the Institution of Mechanical Engineers (IMechE).



MARCO FRACCHIA
OPERATIONS MANAGER, VOCIS LTD

Marco Fracchia has responsibility at Vocis for co-ordinating business development and providing an effective framework for programme delivery and quality systems. He is a Chartered Engineer with 15 years' experience in driveline systems, with an academic background in mechanical engineering, and stays involved at a technical level focused on transmission control and hybrid applications, delivering driveline solutions from inception to production. Clients range from premium brand passenger cars to smaller, specialist UK-based suppliers.



ROBERT GENWAY-HADEN
GLOBAL CHIEF ENGINEER, JAGUAR LAND ROVER, VOLVO AND PSA, GKN DRIVELINE

Robert Genway-Haden joined GKN in 1988 as a graduate-in-training with assignments in product development, purchasing and manufacturing in the UK and Germany. Between 2003 and 2011 he led the opportunity development and product application for GKN Driveline's torque business in the Americas, matching innovative GKN technologies with the customers' vision for their vehicle. In September 2014 he took the additional role as Global Chief Engineering for Jaguar Land Rover, assuming responsibility for Volvo and PSA in 2015. Robert has 19 published patents, of which four are granted.

BOOKING FORM

EVENT CODE: S6340

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29 JANUARY 2016**

DEVELOPMENTS IN TRANSMISSION AND DRIVELINE TECHNOLOGY

22 March 2016, Birmingham

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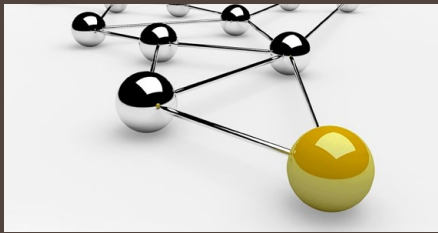
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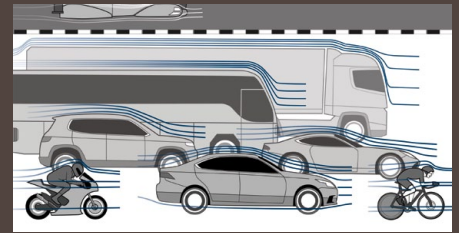
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