



CTI Symposium USA

Automotive Transmissions, HEV and EV Drives

9 – 12 May 2016, Novi, MI



Robert Lee,
Vice President - Engine Powertrain and Electrified Propulsion Systems Engineering, FCA US LLC, USA



Dr Ryozo Hiraku,
Alliance General Manager, NISSAN Motor Co., Ltd, Japan



Charles Gray,
Director, Transmission & Driveline Engineering, Ford Motor Company, USA



Tim Grewe,
Electrification General Director, General Motors, USA



Dr Klaus Küpper,
Executive Chief Engineer Systems, Software and Vehicle, AVL List GmbH, Austria



Larry Nitz,
Executive Director, General Motors, USA



Dr Günter Fraidl,
Senior Vice President, Powertrain Systems Passenger Cars, AVL List GmbH, Austria



Bernd Eckl, Executive Vice President Sales, Marketing, Business Development & Corporate Communications, GETRAG, Germany



Jeff Hemphill,
Chief Technical Officer, Schaeffler Group USA, Inc., USA



Phil Yuhasz,
Director, Powertrain Controls, Calibration & NVH, Ford Motor Company, USA



Dr Hong Jiang,
Managing Director, AVL China, China



NISSAN MOTOR CORPORATION



TOYOTA



- + Special Topics**
Latest high number speeds ATs, Dedicated Hybrid Transmissions (DHT), RDE, Commercial Vehicles, NVH, Autonomous Driving, Manufacturing
- + 2-Day Introductory Seminar**
Basics and practice of automotive transmissions specially tailored to those who want to refresh their knowledge or start working in this business field!
- + Transmission Expo**
50 companies showing new products and developments
New companies joining the exhibition!
- + Evening Networking Party**
An outstanding opportunity to network with your international peers!
- + Test Drive**
Experience latest series and development cars!

Hear the most interesting technology updates from companies such as:

- AAM
- AVL
- BorgWarner
- Bosch Transmission Technology
- Dana
- Denso
- Drive System Design
- Dynax
- Exedy
- FEV
- GKN
- GiF-Entwicklungsgesellschaft
- Hoerbiger
- IAV
- IHS
- Liebherr-Gear Technology
- LuK
- Mangnomatics
- Robert Bosch
- Romax
- Schaeffler
- Smart Manufacturing Technology
- TEMIC
- Torotrak

Advisory Board North America



Dr Hamid Vahabzadeh (Chairman), Vice President & Product Line Manager Global Transmissions, AVL List GmbH
Thomas C. Brown, General Manager-Drivetrain Engineering, Aisin Technical Center of America
Toshimasa Doi, Senior Executive Managing Officer, EXEDY Corporation
Chris Hennessy, Vice President of Powertrain Systems, IAV Automotive Engineering, Inc.
Neil Jackson, Managing Director and Senior Manager Product Development, GETRAG



John Juriga, Director Powertrain, Hyundai America Technical Center Inc.
Robin Kendrick, Vice President, BorgWarner Inc. and President & GM, Transmission Systems, BorgWarner Drivetrain Group
Ramasunder Krishnaswami, Chief Engineer, Global P/T NVH, Ford Motor Company
Peter Kuepper, Technical Service Development Drivetrain Liaison USA, BMW of North America, LLC
Joseph Lemieux, Senior Manager, Electrified Powertrain Power Devices, FIAT Chrysler Automobiles



In Cooperation with:
Prof. Dr Ferit Küçükay,
 Director of the Institute of Automotive Engineering,
 Technical University of Braunschweig



Jeffrey Lewis, Vice President of Driveline & Transmission Systems, Ricardo Inc.
Patrick Lindemann, Vice President Product Development Transmission Technologies, LuK USA LLC
Noel R Mack, Director - Development, New Energy Engineering Institute, Great Wall Motor Co., Ltd.
Berthold Martin, Senior Manager, Advanced Transmission Engineering, FIAT Chrysler Automobiles
Shaun Mepham, President, Drive System Design Inc.



David Petrovski, Principal Analyst, NA Powertrain Forecasting, IHS Automotive
Craig Renneker, Chief Engineer - Front-wheel-drive A/T&D/L Systems, Transmission & Driveline Engineering, Ford Motor Company
Eric C. Sandstrom, Director, Global Transmission Advanced Engineering, General Motors LLC
Jun Shiomi, President, JATCO USA, Inc.
Dr Jörg Trampler, Car Powertrain Technology, Director of Engineering Center North America, ZF North America, Inc.



Honorary Member:
Philip Gott,
 retired Senior Director Long Range Planning,
 IHS Automotive

“No better place to network with colleagues and see the latest thinking of those in our industry”

Ken Mathis, Toyota Technical Center

“Great panel and technical program with high concentration of best transmission and drivetrain engineers”

Darrell Robinette, General Motors

“The latest developments in transmission, driveline technology, the companies, individuals that are making it happen, all under one roof”

Andrew Fanning, GETRAG

“For transmission related conferences, CTI is the single conference you should not miss”

Wayne Petzke, IAV

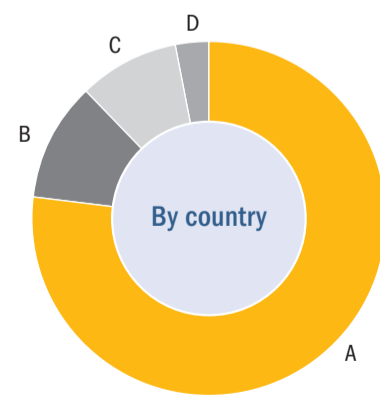
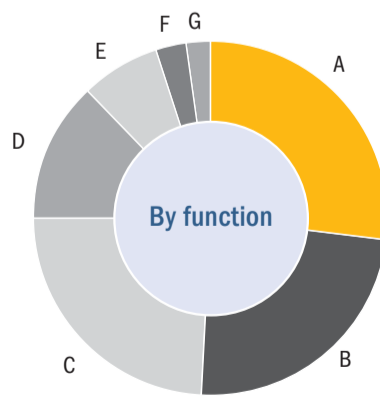
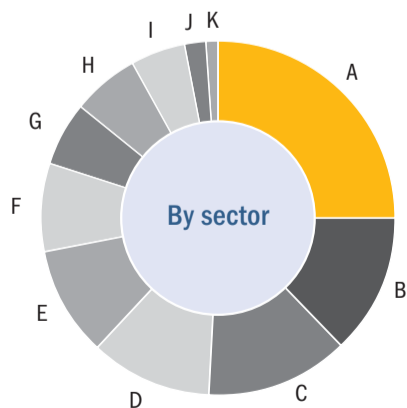
“Absolutely have to attend when you are in the transmission/drivetrain area”

Thomas Meier, TransForm Automotive, Inc.



Participant Structure

Who you are going to meet



A	Automotive Suppliers (without Transmission Manufacturers)	25%
B	Transmission Manufacturers	13%
C	OEM	13%
D	Metal Processing	11%
E	Engineering/Development Service Providers	10%
F	Electric/Electronics	8%
G	Mechanical Engineering	6%
H	Mineral Oil & Chemical Industry	6%
I	Plastic Industry	5%
J	University/Institute	2%
K	Others	1%

A	R&D/Transmission Dev./Powertrain	27%
B	Engineering/Design	24%
C	Marketing/Sales	24%
D	General Management	13%
E	Business Development	7%
F	Others	3%
G	Project Management	2%

A	Northern America	77%
B	Germany	11%
C	Europe without Germany	9%
D	Asia	3%

2-Day Introductory Seminar 9 and 10 May 2016

Symposium Day One Wednesday, 11 May 2016

9.00 Reception and handout of the proceedings

Basics and Practice of Automotive Transmissions

Objective

Newcomers and beginners will get an overview on the basics of conventional drives during the Introductory Seminar. Based on road resistance as well as electric motor and combustion engine maps, the role of launch devices, transmissions and other drive train elements will be defined.

About the instructors

The Introductory Seminar will be held by the Institute of Automotive Engineering (IAE), Technical University of Braunschweig, Germany. The IAE under the direction of Prof. Dr Ferit Küçükay has a rich and very well grounded experience in all relevant areas of automotive research and development. It is the leading institute in Germany for automotive transmission development. With its close contact to the automotive and supplier industry, technical service providers, inspection authorities and public research institutions as well as national and international interdisciplinary working methods it is very well experienced in solving complex problems and ensuring up-to-date seminars. The IAE holds this introduction regularly as an integral part of the CTI Transmission Symposium in Berlin (Germany) and in Shanghai (China).

Automotive drive concepts

- Drive characteristics and driving resistances, basics of longitudinal dynamics
- Background and function of starting devices, transmissions, hybrid and electric drives
- Design and function of
 - conventional drive concepts
 - serial, parallel and power-split hybrid drives
 - electric drives
- Market and development trends

Prof. Dr Ferit Küçükay,

Director, Institute of Automotive Engineering, Technical University of Braunschweig, Germany

Design layouts

- Launch devices – clutch, dual-mass flywheel, torque converter
- Transmission concepts (1):
 - Manual transmission (MT) – two and multiple-shaft transmission for front-wheel and standard drive

Lin Li,

Scientific Assistant, Institute of Automotive Engineering, Technical University of Braunschweig, Germany

Design layouts and drive train management

- Transmission concepts (2):
 - Automated manual transmission (AMT) – “add on” and integrated solutions
 - Dual-clutch transmission (DCT) – in production, application, introduced prototypes
 - Automatic transmission (AT) – different gear set arrangements, examples of application
 - Continuously variable transmission (CVT) – layout, chains and belts, driveability
 - All-wheel drives

Carl-Philipp Seekamp,

Scientific Assistant, Institute of Automotive Engineering, Technical University of Braunschweig, Germany

Drive train management

- Drive train management and operating strategy
- Control – shifting characteristics, applications
- Interfaces – to engine, body, chassis

Florian Schober,

Scientific Assistant, Institute of Automotive Engineering, Technical University of Braunschweig, Germany

Schedule Day One:

- 9.00 Reception and handout of the proceedings
- 9.30 Begin of the seminar
- 1.00 Lunch break
- 5.00 End of day one

Schedule Day Two:

- 9.00 Begin of the seminar
- 1.00 Lunch break
- 5.00 End of the Introductory Seminar

Coffee breaks will be handled flexibly

Pre-Check-in for Main Days & Welcome Get Together Tuesday, 10 May 2016: 5 – 7 p.m.



Your CTI Contacts



Organisation Hannah Lesehr

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Project Management Sylvia Zenzinger

Conference Director Transmission Symposia
Phone: +49 (0)2 11.96 86-38 84
Email: sylvia.zenzinger@car-training-institute.com

7.45 Registration and hand out of the conference documents, opening of the Transmission Expo

Plenary Speeches

8.30

Welcome Address by CTI and the Chairman



Dr Hamid Vahabzadeh,

Vice President & Product Line Manager Global Transmissions,
AVL List GmbH, USA

8.40

Topic tbd



Robert Lee,

Vice President - Engine Powertrain and Electrified Propulsion Systems Engineering,
FCA US LLC, USA

9.00

Considerations of necessary powertrain technologies in the coming century

- ICEs and TMs still would have an important role
- But PT efficiency will come up against the limitation
- Next step, high level technical flexibility will be demanded for PT



Dr Ryoza Hiraku,

Alliance General Manager,
Powertrain Advanced Engineering Department,
NISSAN Motor Co., Ltd, Japan

9.20

All-new Ford 10-speed RWD planetary transmission design & development

- A discussion of efficient power-flow and related technologies



Charles Gray,

Director, Transmission & Driveline Engineering,
Ford Motor Company, USA, and

Kevin Norris,

Manager, 10R Programs,
Ford Motor Company, USA

9.40

Cadillac CT6 RWD PHEV propulsion system

- System technical performance specification review
- Capability and features of components
- System & component operating data review



Tim Grewe,

Electrification General Director,
General Motors, USA

10.00

Dedicated hybrid transmissions (DHT) – a new category of transmissions

- Definition of the new transmission category DHT, separation from others
- Market trends and developments for DHTs
- Examples of various DHTs and introduction of the new session



Dr Klaus Küpper,

Executive Chief Engineer Systems,
Software and Vehicle, AVL List GmbH, Austria

10.20 – 10.40 Discussion with the morning speakers (Q&A)

10.40 – 11.30 Coffee break and visit to the Exhibition

11.30 – 12.30 **PANEL DISCUSSION**

How will engine and electrification technology impact future transmissions?



Moderator:

Larry Nitz,

Executive Director, General Motors, USA

PANELISTS: Bernd Eckl, GETRAG • Dr Günter Fraidl, AVL List GmbH • Dr Kiran Govindswamy, Director, Powertrain, Vehicle Engineering, and NVH, FEV North America, Inc. • Charles Gray, Ford Motor Company • Dr Ryoza Hiraku, NISSAN Motor Co., Ltd • John Juriga, Director Powertrain, Hyundai America Technical Center Inc.

12.30 – 2.00 Lunch break and visit to the Exhibition

1.30 – 2.00 **SOLUTION FORUM**

Smart sensing – integrated mechatronic solutions for decentral transmission concepts

- Powerstack: a platform friendly approach for inverter controls
- How high-temperature proven MCU technologies might enhance transmission performance
- Smart sensor clusters – technologies for the next level of integrated measuring of position, speed and more

Stefan Wahlmüller,

Field Application Engineer North America, TT Electronics plc., USA

Symposium Day One

Wednesday, 11 May 2016 – Parallel Sessions

Dedicated Hybrid Transmissions (DHT)

2.00

Prius raises the bar again

- The principle of Toyota Hybrid System (THS)
- E-motor integration into the transmission
- Evolution of the system since 1997

Heraldo Stefanon, Manager for HV and Drivetrain, Toyota Technical Center, USA

2.30

Development and evaluation methodologies for dedicated hybrid transmissions

- The role of transmission for future emission targets
- How far can transmission influence hybridization?
- Add-on hybrid solutions vs. dedicated hybrid transmissions

Muammer Yolga, Department Manager System and Software (DTS), AVL List GmbH, Austria

3.00

All-wheel-drive power-split hybrid powertrains

- Systematic design methodology and application to screen and evaluate AWD multi-mode hybrid trucks
- Identification of power split powertrains that achieve balance between driving performance and FE

Dr Huei Peng, Professor, Mechanical Engineering, University of Michigan, USA

Transmission Concepts: CVT

2.00

CVT with fixed gear ratios using two planetary gearsets

- Concept of CVT with fixed gear ratios using planetary gearsets
- Transmission powerflow synthesis
- Stick diagram results from the powerflow analysis

Dr Chi-Kuan Kao, Technical Fellow, Propulsion Systems Research Lab, General Motors, USA

2.30

New electric and hydraulic control system for JATCO's new CVT

- JATCO's new generation CVT feature
- Control system for the new generation CVT
- Key technologies for the new control system

Kenji Sakakibara, Hardware System Development Department, Jatco Ltd, Japan

3.00

The cone ring transmission (CRT) will go into production!

- Concept of CRT: layout, function and controls
- Status of development: design, durability & manufacturing issues
- Transition from prototype to production transmission

Dr Heinz-Dieter Schneider, Manager Development, GIF-Entwicklungsgesellschaft mbH, Germany

Commercial Vehicles

2.00

System optimization in a hybridized on-road commercial vehicle

- Simulation-based requirements management on vehicle level
- System design of electrified powertrain
- System and component optimization in electrified powertrains

Jason J. McConnell, Business Unit Director, Electrification & Hybrid, IAV Automotive Engineering, Inc., USA

2.30

Development of power shift transmissions for future CV

- Power train trends and their impact on the transmission
- Process for defining optimal transmission configurations
- New modular 9-speed power shift transmission
- Development potentials of new solutions

Rico Resch, Project Manager, IAV GmbH, Germany

3.00

Developing a cost-efficient flywheel hybrid system for city buses

- Design iterations to productionize the city bus KERS
- Performance and endurance test rig data
- Validation in the real world
- Route to volume production

Tobias Knicke, Director of Business Development, Commercial, Torotrak Group, UK

3.30 – 4.15 Coffee break and visit to the Transmission Expo

4.15

Dedicated hybrid transmission solutions for all-wheel-drive vehicles

- Review of the vehicle types and their suitability to the DHT
- Review of the architecture landscape to achieve the performance requirements of the AWD vehicle
- Selection of suitable systems
- Detailed system description

Shaun Mephram, Director, Drive System Design Inc, USA

4.45

Research on new 3-mode hybrid transmission system concept

- Feasibility study for hybrid components
- Defined as dedicated hybrid transmission (DHT)
- Performance evaluation with demonstrator vehicle

Seiichiro Washino, Project Assistant Manager, Corporate R&D, DENSO Automotive Deutschland GmbH, Germany

5.15

Multi-mode transmission – an unique hybrid gearbox concept

- Transmission requirements
- Function and layouts
- Development trends

Joe Palazzolo, Director eDrive and Chief Engineer eDrive, GKN Driveline, USA

4.15

VT5, the next high efficient CVT generation

- VT potential
- VT5 family approach
- VT5 lay-out
- Efficiency measures

Gert-Jan Vogelaar, Strategic Marketing Director, Punch Powertrain NV, Belgium

4.45

Material developments to optimize pushbelt CVT power density

- Development of new materials to optimize the pushbelt CVT
- New pushbelt CVT materials with improved fatigue properties
- Pushbelt CVT power density increase by application of new alloys

Bert Pennings, Research Engineer, Advanced Engineering, Bosch Transmission Technology B.V., Netherlands

5.15 DHT

Fuel efficiency advancements using Dana's VariGlide CVT

- Multi-mode powerpaths using Dana's VariGlide technology
- High efficiency light and mid-size CVT technology solutions
- Versatility of Dana's continuously variable planetary technology

Travis Miller, Transmission Technical Specialist, Dana Holding Corporation, USA

4.15

Dual clutch transmission in commercial vehicles

- Eaton® Prociion™ 7-speed dual clutch
- Technology development that targets commercial vehicle driveline improvements
- Dual clutch transmission with wet clutch technology evolution

Jeffrey Carpenter, Engineering Manager, Commercial Powertrain Truck, Eaton Corporation, USA

4.45

Real world test cycle experiences for class 5 hybrid box truck

- Review of basic hybrid powertrain system architecture & features
- FE experiences over real-world standardized drive cycles
- Comparison of fuel consumption to conventional class 3 truck

Nehal Rahim, Manager – Auto Transmission Hardware, Aisin Technical Center of America, USA

5.15

Automatics vs. automated manual transmissions – comparing the physics

- Positive impacts of the TC10 automatic architecture, component technologies, and control features
- Benefits of powershifts on fuel efficiency
- Torque converter vs. launch clutch energy

Dane Rodgers, Manager, TC10 Transmission, Allison Transmission Inc., USA

5.45

End of day one & transfer to the evening event

6.30

Start of the evening event

Approx. 9.00 & 9.30

Return of shuttle busses to the hotel

CTI Networking Night

Even more networking possibilities!



Again CTI takes you to an amazing venue: the CTI Networking Night 2016 is going to take place at the Jack Roth Stadium Club. Be overwhelmed with the breathtaking view on the field. Enjoy the relaxed atmosphere and get spoiled with finest food and drinks and take a look behind the scenes during guided tours.

Transmission Components: Starting Devices

2.00

Multi-mode clutch module – application and performance

- Innovative usages of mechanical clutches in transmissions
- Increased clutch system flexibility and performance
- Efficiency improvements with mechanical clutches

Calahan Campton, Advanced Product Engineer,
BorgWarner Transmission Systems, USA

2.30

Cone clutches for automatic transmissions

- Improved efficiency for ATs
- Form fit replaces force fit
- Controlled DCT-type synchronizer

Ottmar Back, Head of Product Management,
HOERBIGER Antriebstechnik GmbH, Germany

3.00

Friction plate concepts for low mass and clutch design options

- Product/process R&D for low mass aluminum core plates
- Hemmed spline design for mass and axial space reduction for improved torque capacity, shift feel and fuel saving opportunities

David Vierk, Engineering Manager, BorgWarner, USA

3.30 – 4.15 Coffee break and visit to the Transmission Expo

4.15

3rd generation pendulum absorber in torque converters

- Design of the 3rd gen. torque converter pendulum absorber
- TC designs to enable widespread pendulum absorber adaption
- Pendulum absorber enables

Markus Steinberger, Manager Torque Converter Clutch and Damper Design, LuK USA, USA

4.45

The technical movements and the coming future of torque converters (TC) for CVT

- Transition of requirements on TC for CVTs
- Technical specifications of TC for CVTs
- Future TC for CVTs

Ken Mototsune, Assistant General Coordinator,
EXEDY Corporation, Japan

5.15

World's 1st production selectable one way clutch for AT

- Design basis for the technology
- How and where is the device used in the automatic transmission
- Advantages of selectable one way clutch for customers A and B

Jeff Prout, Director of Engineering – Asia Products, and
Rob Fetting, Director of Engineering – North American Products,
Means Industries, Inc., USA

5.45

6.30

Approx. 9.00 & 9.30

End of day one & transfer to the evening event

Start of the evening event

Return of shuttle busses to the hotel

Manufacturing

2.00

Transmission manufacturing in global challenge

- Overseas innovation trend impact
- Manufacturing renaissance to digitalization
- Mastering future challenges

Dietmar von Polenz, Interim Manager,
INTERIM [4]AUTOMOTIVE, Germany

2.30

How to adapt transmission manufacturing to volatile markets

- Market trends which influence transmission manufacturing costs
- Potential solutions to increase the flexibility and scalability

Dr Stephan Weng, COO, GETRAG, Germany

3.00

Technologies for electrical drive train manufacturing

- Manufacturing of electrical drive trains in an I4.0 surrounding
- New battery process development
- Development and manufacturing according to ISO 26262

Dr Bernhard Budaker, Head of Business Unit, Automotive,
Fraunhofer IPA, Germany

CTI Test Drive 11 & 12 May 2016



Impressions of the CTI Test Drive 2015

During 11th and 12th May you will have the opportunity to experience the latest transmission and drive technology in series and demonstrator cars. Project engineers will be introducing the special characteristics and advantages of the technologies shown and answer your personal questions.

Information about available vehicles will be updated online.

(Valid driving licence has to be shown on site for registration.)



Your Contact



Test Drive

Maria Forko

Project Assistant Transmission Symposia

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Email: maria.forko@car-training-institute.com

ANNOUNCEMENT

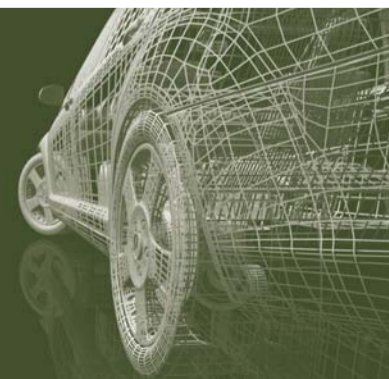
Please forward the information about our ISO conference to your colleagues!

5th International CTI Conference

ISO 26262 USA

6 to 8 June 2016, Royal Park Hotel, Rochester, Detroit area (MI), USA

www.car-training-institute.com/iso26262-usa



Symposium Day Two Thursday, 12 May 2016

Plenary Speeches

8.30 Opening of the program by the Chairman and CTI

8.40 Real driving emissions and their impact on future powertrains

- RDE challenges
- RDE benchmark
- Future RDE solutions



Dr Günter Fraidl,
Senior Vice President,
Powertrain Systems Passenger Cars,
AVL List GmbH, Austria

9.00 How can we meet the need for real world efficiency?

- What "efficiency" means for car drivers, industry and authorities
- How today's drive cycles reflect emissions reality
- Opportunities and limitations of electrified powertrains
- Powertrain and transmission designs for real-world requirements



Bernd Eckl,
Executive Vice President Sales, Marketing,
Business Development & Corporate Communications,
GETRAG, Germany

9.20 US mobility 2030 – car sharing in BEV's or road trips in V8's?

- Which global trends impact the US?
- What are the unique, region trends?
- Which drivetrain concepts fit the market needs?
- What innovations are in development to help with these challenges?



Jeff Hemphill,
Chief Technical Officer,
Schaeffler Group USA, Inc., USA

9.40 Fuel economy and OBD impact to powertrain controls

- Regulatory direction – OBD growth
- Expanding powertrain (transmission, driveline and engine) technologies
- Less combustion, more electrification



Phil Yuhasz,
Director, Powertrain Controls, Calibration & NVH,
Ford Motor Company, USA

10.00 What Chinese customer is expecting?

- Developed and developing China
- Global companies and local brand companies' approach of transmission product
- Some new challenges: Does fuel consumption regulation and electrification incentives drive to DHT?



Dr Hong Jiang,
Managing Director,
AVL China, China

10.20 – 10.40 Discussion with the morning speakers (Q&A)

10.40 – 11.30 Coffee break and visit to the Exhibition



Media Partners



Marketing and Cooperations

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Head of Marketing CTI
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Email: roman.irlinger@car-training-institute.com

Symposium Day Two Thursday, 12 May 2016 – Parallel Sessions

Transmission and Driveline Concepts; Axles

11.30 Next generation RWD transmissions with integrated electrification

- Future engine and transmission matching
- Dual and triple clutch RWD transmission concepts
- Opportunity for integrated electrification and benefits

Dr Darrell Robinette, Electrification Architecture Engineer,
General Motors Powertrain, USA

12.00 Value assessment of automotive transmission options

- Current production transmission technologies
- Factors influencing the selection of transmission technologies
- Ranking of current and forecasted transmission technologies on a vehicle segment basis

Greg Kolwich, Manager – Production Development,
FEV North America, Inc., USA

12.30 – 2.00 Lunch break and visit to the Transmission Expo

2.00 Two-drive-transmission: potentials in terms of system integration

- Hybrid powertrain
- Transmission control unit
- System integration

Andreas Viehmann, Research Assistant,
IMS, TU Darmstadt, Germany

2.30 Dedicated to e-mobility: PHEV product modularity from ZF

- New plug-in hybrid transmissions from ZF
- Modular kit for cost optimization on system and component level
- Optimized package situation by high level of component integration

Dr Stefan Kilian, Senior Manager Car Powertrain Technology,
Product Line Hybrid Transmissions, ZF Friedrichshafen AG, Germany

3.00 – 3.45 Coffee break and visit to the Transmission Expo

3.45 The new 8-speed FWD automatic transmission for General Motors

- Global rollout for midsize, crossover and luxury vehicles
- Common base transmission and smart adaptations per model
- Global team covers diverse market and application needs

Georg Bednarek, Global Chief Engineer and Global Program
Manager Automatic Transmissions, GM Powertrain, Germany

4.15 GKNs new high performance eAxle for the Volvo XC90 T8

- Hybrid concept of the Volvo XC90 T8
- Gearbox specification and its resulting integrated design
- Electronic disconnect differential (EDD)
- Development challenges (package, NVH, efficiency, lubrication)

Colin Zaers, Team Leader, Hybrid & eDrive Program Engineering
Management, GKN Driveline, Germany

4.45 Optimization of the class one light truck power loss

- Review of the system power losses and breakdown to each element
- Comparison of technologies to improve system element losses
- Ranking of benefits for hypoid, bearings, lubrication and seals

Jon Brentnall, VP Engineering, Drive System Design Inc, USA

5.15 Change to plenary hall

5.20 Summary of the Symposium by the chairman

Powertrain Electrification

11.30 SOLUTION FORUM You would like to present your product or solution in the scope of a Solution Forum?

Contact us to get more information:

Michael Follmann

Sales Director

Email: michael.follmann@car-training-institute.com

12.00 EV transmission lessons learnt

- Design guidelines for architecture
- Guaranteeing low NVH
- Mounting strategies and arrangements
- Recommendations for multispeed systems

Alex Tylee-Birdsall, Director, Drive System Design Ltd, UK

2.00 HEV propulsion systems using a continuously variable planetary

- Adoption of continuously variable planetary in hybrid systems
- Power path concepts utilizing a CVP
- Overview of control schemes targeting maximum efficiency

Krishna Kumar, Senior Engineer, Advanced Engineering,
Dana Holding Corporation, USA

2.30 Torque-vectoring P4 electric drive unit for HEV applications

- Enhanced agility and handling plus reduced fuel consumption
- Enhanced traction performance with fuel economy benefits
- Improved safety feel and improved MPG

Jeff Ronning, Senior Manager, Electrification Systems, AAM, USA

3.45 Start/stop coasting and 48V hybrids: enabling a real CO₂ solution

- Next gen. mHEV transmissions needed to meet CAFE requirements
- Regulatory roadblocks to meeting targets with innovative tech
- Full hybrid experience with mild-hybrid components

Jason Schwanke, Senior Engineer, Gasoline Systems and Advanced
Engineering, Robert Bosch LLC, USA

4.15 Future 48V hybrid & electric drives

- 48V BSG: a simple approach for decrease of fuel consumption and emissions
- New P2 application: more possible saving and higher integration
- Outlook 48V electrical driving
- 48V – the only power supply system for automotive?

Speaker tbc, TEMIC Automotive Electric Motors GmbH, Germany

4.45 48 Volt torque vectoring electric rear drive module (eRDM)

- Uncompromised full-function torque vectoring and AWD performance
- 48V electric hybrid functionality for increased fuel economy and reduced CO₂
- Modular and adaptable to existing 48V vehicle architectures

Thad Kopp, Senior Staff Engineer, Advanced Engineering,
BorgWarner TTS, USA

Markets, Strategies, Requirements; Autonomous Driving

11.30

Transmission market development for light vehicles until 2025

- Market shares of transmission types across regions until 2025
- Analysis of important drivers and trends
- Cost-benefit comparison of transmission types

Dr Karsten Wasiluk, Consultant, Automotive, Schlegel und Partner, Germany

12.00

Transmission market evolution and life cycle analysis

- Transmission market outlook
- Transmission life cycles
- Will transmission life cycles stabilize?

Berthold Martin, Senior Manager, Advanced Transmission Engineering, FIAT Chrysler Automobiles, USA

NVH; Lubrication flow; Vehicle Performance Forecasting

11.30

Torsional vibration (TV) reduction with MAGSPLIT® dedicated hybrid transmission (DHT)

- TV transmission in conventional powersplit powertrain/CVT
- MAGSPLIT® (DHT) principal of operation with virtual variator
- Testing and results

• Conclusions, benefits and summary
David Black, Product Manager – Hybrid Drives, Magnomatics Limited, UK

12.00

Vehicle-focused transmission NVH development

- Vehicle-level sound quality requirements
- Influence of transmission noise on overall powertrain noise
- Development of a process for transmission-induced vehicle noise assessment
- Case-study examples to illustrate use of the developed process

Dr Kiran Govindswamy, Director, Powertrain, Vehicle Engineering, and NVH, FEV North America, Inc., USA

Methods and Tools

11.30

Advanced approach for layshaft gear set synthesis and analysis

- Requirements for transmission development
- Steps of synthesis process
- Characteristics of optimized transmission gear sets

Dr Gereon Hellenbroich, Department Manager Design and CAE, Transmission Systems, FEV GmbH, Germany

12.00

Software-based lightweight design by load and lifetime monitoring

- Continuous generation of load profiles under operating conditions
- Remaining service life prediction in series-production vehicle
- New approach for transmission design

Prof. Dr Stephan Rinderknecht, Head of the Institute for Mechatronic Systems in Mechanical Engineering, Technical University Darmstadt, Germany

12.30 – 2.00 Lunch break and visit to the Transmission Expo

2.00

Remote software updates and cyber-security are inseparable

- Remote software emerging and will be required eventually
- Cyber-security is a threat to all connected cars
- Remote software updates and cyber-security must go together

Dr Egil Juliussen, Director Research & Principal Analyst, Automotive Technology, IHS Inc., USA

2.30

Real-world emissions: a case study of 1000 automobiles

- European emissions legislation
- Real-world performance in Europe and the USA
- Applying data to improve emissions

Jane Thomas, Global Sales Manager, Emissions Analytics, UK

2.00

Predictive co-simulation of vehicle fuel economy vs. NVH

- GT-POWER variable displacement engine model
- MSC Adams 3D multi-body vehicle model
- Balancing driveline NVH and vehicle fuel economy

Jonathan Zeman, Senior Engineer, Gamma Technologies, Inc., USA

2.30

Integrated electro-mechanical design process for EV powertrains

- Electro-mechanical design trade-offs at the concept design stage
- NVH powertrain response to gear and electrical machine excitation
- Multi-fidelity modelling for optimum simulation speed and insight

Dr Melanie Michon, R&D Programme Manager, Romax Technology Ltd, UK

2.00

Design approach process for transmission control solenoid applications

- Typical requirements for solenoids
- Introduction to automated construction procedure
- Consideration of constructive boundary conditions

• Integration into engineering processes

Andrew Yermak, Lead Engineer, Robert Bosch LLC, USA

2.30

Vehicle with CVT transmission mechatronic testing and simulation

- Performances optimization through model based system engineering
- Multi-physics and multi-attributes CVT troubleshooting
- Model based design process for CVT transmissions improvement

Raphael Rhoete-Vaney, System Simulation Technology Manager, MBSE Engineering Services, Siemens PLM, USA

3.00 – 3.45 Coffee break and visit to the Transmission Expo

3.45

How autonomous driving affects transmission design

- Is current transmission technology ready for autonomous driving?
- How robotised functions enable new design opportunities
- DCT-based solutions for conventional and hybrid drives

Dr Carsten Bänder, Senior Manager Product Engineering, GETRAG, Germany

4.15

Powertrain performance design for autonomous driving

- Driving force control at low demand for acceleration/deceleration
- Required function for engine, auxiliaries and transmission
- High resolution by harmonized control and hardware specifications

Hiroshi Tatsuta, Deputy General Manager, Powertrain Advanced Engineering Department, Nissan Motor Co., Ltd., Japan

4.45

Driverless cars (DLC) favor battery EVs

- DLCs eliminate BEV drawbacks
- Operating cost/mile favors DLC fleets

Dr Egil Juliussen, Director Research & Principal Analyst, Automotive Technology, IHS Inc., USA

3.45

Noise study and attenuation on PTO in agricultural transmission

- Clutch development methodology for noise reduction
- NVH measurement techniques
- Clutch optimization

Sundaravadevel Murugesan, Senior Member, Research and Development, Tractor and Farm Equipment Limited, India

4.15

High-precision design method of lubrication flow distribution

- Importance of lubrication flow distribution design
- Current design method and issue to be improved
- New design method which realized good accuracy of prediction

Chun-Mei Li, Assistant Senior Research Engineer, Product Development Office, JATCO Korea Engineering Corp., Korea

4.45

Vehicle performance and compliance forecasting

- Methodology for forecasting CO₂ and MPG
- Fleet and automaker compliance assessment of current US powertrain sales forecast
- What gaps exist, and how can those gaps be closed?

David Petrovski, Principal Analyst, Powertrain Forecasting, IHS Automotive and
Gregory Pannone, President, Novation Analytics, USA

3.45

Methods for low fuel consumption transmission clutch disk design

- Designing of high efficiency transmission wet clutch
- Modeling-CFD simulation for reduction of drag torque of clutch
- Reduction of fuel consumption by improving efficiency of clutch

Dr Shahjada Pahlovy, Technical Team Leader, Advanced Technology Development Team, Dynax Corporation, Japan

4.15

Virtual calibration of conventional & hybrid drivetrain strategy

- Clearly structured target setting for drive strategy calibration
- Rating based comparability of drive strategy calibrations
- Virtual evaluation, analysis and optimization of calibrations
- Method enable the frontloading approach in calibration

Falko Pflüger, Senior Calibration Engineer Transmission and Hybrid, AVL List GmbH, Austria

4.45

Calibration strategies for automatic engine start/stop refinement

- Customer requirements for automatic engine start/stop behavior
- Engine calibration strategies for start/stop refinement
- Transmission calibration strategies for start/stop refinement
- Case-studies illustrating powertrain calibration strategies

Thomas Wellmann, Supervisor, Transmission and Driveline Systems, FEV North America, Inc., USA

5.15 Change to plenary hall

5.20 Summary of the Symposium by the chairman

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BorgWarner Inc.
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Bosch
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Exhibitors



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Felss Shortcut Technologies
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Company Presentation



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