VDI

Dritev

International VDI Congress

Dritev – Drivetrain for Vehicles

June 27 and 28, 2018, Bonn

Main topics:

- Automatic and dual clutch transmissions
- Transmission topologies as part of electrified powertrains
- E-axles
- Hybrid modules
- Use of artificial neural networks in simulation
- Development tools

Dritev Interactive
Dritev Lab + Round Tables

www.dritev.com
#VDI_Drive

Lecturer companies amongst others

Panel discussion: Urban Mobility 2030 caught between political, societal and technological objectives

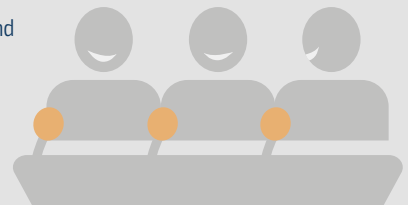
Prof. Dr. Uwe-Dieter Grebe, Global Business Development, Sales and International Operations Passenger Cars and Powertrain Systems, AVL List GmbH

Charles Huang, Vice President E Powertrain, NIO

Toralf Müller, Managing Director, Verkehrsbetriebe Hamburg-Holstein

Gunnar Herrmann, Vice President Quality, Chairman of the Management Board, Ford-Werke GmbH

Reinhard Otten, Strategy Climate and Ressource Protection, Audi AG



Accompanying congresses
International VDI Congress
EDrive

5. International VDI Congress
Transmissions in mobile machines

Program - Overview

VDI Wissensforum

Dritev – Drivetrain for Vehicles

Anmelden unter: www.dritev.com

Room New York

1st Congress Day
Wednesday, June 27, 2018

- 07:30 Registration
- 08:30 **Welcome and plenary lecturers**
- 09:45 Coffee break and visit to the exhibition
- 10:30 **Plenary lecturers**
- 12:00 Lunch and visit to the exhibition

	Room New York	Room Addis Abeba	Room Nairobi	Room Wien	Room Bangkok
13:15	**Dritev**			**Accompanying congresses**	
	AT/DCT	Tools/ Component optimization	Transmission topologies as part of electrified powertrains	EDrive	Transmissions in mobile machines
15:15	**Dritev**			**Accompanying congresses**	
	CVT	Synthesis	E-axle	EDrive	Transmissions in mobile machines
15:45	WM Special: Public Viewing in the exhibition				
18:00	**Dritev**			**Accompanying congresses**	
	CVT	Synthesis	E-axle	EDrive	Transmissions in mobile machines

- 19:00 End of the 1st congress day and evening reception
- 19:30 Evening Speech

2nd Congress Day
Thursday, June 28, 2018

	Room New York	Room Addis Abeba	Room Nairobi	Room Wien	Room Bangkok
08:30	Dritev			Accompanying congresses	
	Systems	Transmission manufacturing	Hybrid modules	EDrive	Transmissions in mobile machines
10:30	Coffee break and visit to the exhibition				
11:15	Plenum - Panel discussion				
12:45	Lunch and visit to the exhibition				
14:15	Dritev			Accompanying congresses	
	Components	Simulation	48V Systems	EDrive	Transmissions in mobile machines
15:45	Awarding of the best presentation award for junior engineers				
16:00	Closing remarks and end of the congress				

Hands-on approach

Focused and dedicated

Cross-functional and cross-industry alignment

Sophisticated technology

Extremely valuable

Dritev

This is your international technology congress for powertrain and transmission developers in Bonn!

Room New York

1st Congress Day:
Wednesday, June 27, 2018

07:30 Registration

08:30 Opening and welcome
Dipl.-Ing. Matthias Zink, CEO Automotive, Schaeffler AG, Bühl, Germany

PLENARY LECTURES

08:45 What moves us and drives us – Future mobility and powertrain
- New mobility concepts open new opportunities
- E-mobility and "well to wheel"
- Drivetrain optimization through system competence

Matthias Zink, CEO Automotive, Schaeffler AG, Bühl, Germany

09:15 Internal combustion engine and electromobility – Competition or synergies?
- Potential to increase the efficiency ICE-powertrains and further CO_2-reduction potential by means of e-fuels
- Emission technologies for passenger car powertrains with respect to the upcoming legislation
- Hybridization to further reduce the emission level and high customer benefit
- Trends for battery electric vehicles – Increase of energy density and cost reduction in order to further improve the attractiveness of these concepts

Prof. Dr. Stefan Pischinger, Head of the Institute, co-authors: Christoph Lentz, both Fakultät für Maschinenbau, Lehrstuhl für Verbrennungskraftmaschinen (VKA), RWTH Aachen University, Dr.-Ing. Ingo Steinberg, Dr.-Ing. Matthias Thewes, both FEV Europe GmbH, Aachen, Dr.-Ing. Michael Wittler, FEV Consulting GmbH, Aachen, Germany

09:45 Coffee break and visit to the exibition

10:30 IONITY – Free E-Mobility

Dr. Michael Hajesch, Managing Director/CEO, IONITY GmbH, Munich, Germany

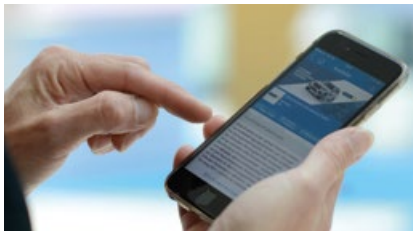
11:00 The first 7DCT automatic transmission developed and produced in China and future technologies
- Project strategy and targets
- Technical highlights and advantages
- Testing and calibration
- Future technologies

Dipl.-Ing. (TU) Gerhard Henning, Executive Chief Engineer Automatic Transmissions, Great Wall Motor Company Ltd., Hebei Province, China

11:30 Future challenges for drive technology in agricultural engineering
- Global requirements and challenges
- Future trends
- Potentials through digital transformation

Dr.-Ing. Heribert Reiter, Vice President Engineering Tractors Global, Managing Director, AGCO GmbH, Marktoberdorf, Germany

12:00 Lunch and visit to the exhibition



Room New York

AT/DCT
Dr. Carsten Bünder, GETRAG Magna Powertrain

13:15 The new generation 8-speed AT for the Opel Grandland X
- Design optimization and weight reduction
- Improved shift quality and fuel economy
- Integration of internal ETRS and Start-Stop Sailing capability
- New oil, friction material and gear surface finishing
- Challenges in hydraulics: off-axis low-loss oil pump, dynamic line pressure and flexible lubrication flow volue control

Dipl.-Ing. Georg Bednarek, Global Chief Engineer & Global Program Manager Purchased Automatic Transmissions, co-authors: Dr.-Ing. Karl Geratz, both Opel Automobile GmbH, Rüsselsheim, Germany, Hervé Chariou, Groupe PSA, La Garenne Colombes, France

13:45 The new BMW automatic transmission
- Fulfillment of future emission and consumption targets
- Significant improvement in sportiness
- Enhanced performance of the transmission sets

Dipl.-Ing. (FH) Martin Roßhuber, Manager Mechanic and Basicfunction Transmission, co-authors: Dipl.-Ing. Günther Schromm, Kilian Kranz, M.Sc., all BMW AG, Munich, Germany

14:15 3rd generation of the 8 gear automatic transmission by ZF
- Drag loss reduction
- Increase of total spread
- Functional measure to reduce the fuel consumption
- Optimization oil supply

Dipl.-Ing. Christian Sibla, Project Manager Development, Basedevelopement Inline Transmission, co-authors: Andreas Donges, Dr. Friedemann Jauch, all ZF Friedrichshafen AG, Friedrichshafen, Germany

Room Addis Abeba

Tools/Component optimization
Prof. Dr.-Ing. Karsten Stahl, Technische Universität München

Churning oil path optimization process development
- Application of moving particle method to analyze churning oil path
- Comparison of CFD method between grid and particle method
- Correlation to bench test with simulation model

Chulmin Ahn, B.Sc., Research Engineer, Hyundai Motor Company, Gyeonggi-do, Korea

Thermal-hydrodynamic optimization of grooves in wet clutch
- Groove shape and orientation: important effects on the thermal-hydrodynamics of wet clutches
- Using of 3D CFD model to analyze groove shapes in order to optimize thermal behavior of clutch
- Rotational effects and ATF film thickness in the model

Mohsen Behzad, PhD, Simulation & Modeling Engineer, BorgWarner Inc., Auburn Hills, Michigan, USA, co-authors: Viren Saxena, Michael Schaefer, both BorgWarner Drivetrain Engineering GmbH, Ketsch, Germany

The impact of efficiency enhanced drivetrain components on the energy consumption of electric and conventional vehicles
- Efficiency improvements in the drivetrain: extreme different impact on the energy consumption
- A highly comprehensible modelling approach for a new view on the different propulsion systems and the coherences which lead to the different energy savings
- The electrification of the propulsion systems: higher energy savings in the future

Christoph Schmahl, M. Eng., Test Coordinator, co-authors: Dr. Wolfgang Hildebrandt, both GKN Driveline International GmbH, Lohmar, Prof. Dr. Dirk Reith, Hochschule Bonn-Rhein-Sieg, Sankt Augustin, Germany

Room Nairobi

Transmission topologies as part of electrified powertrains
Thomas Pfund, LuK GmbH & Co. KG

Electrified automated manual transmission (eAMT) – Synergies by combining an electric drive with an automated transmission
- P4 hybrid solution by electric axle drive
- Electrified automated manual transmission
- Automated manual transmission for full hybrid functionality
- Synergy between electric axle drive and automated manual transmission

Dr.-Ing. Florian Mühlfeld, Team Manager Mechatronics AMT, co-authors: Dipl.-Ing. Matthias Hochrein, Dipl.-Ing. Jörg Buhl, all ZF Friedrichshafen AG, Schweinfurt, Germany

Dedicated Hybrid Transmissions: How a systemic approach accelerates engineering process from concept development to real applications
- Model-based transmission systems analysis and synthesis
- EE HW/SW architecture for HEV/EV application
- Synthesis of actuation mechanisms

Oscar Sarmiento, Global Head Advanced Development, Continental AG, Nuremberg, co-authors: Daniel Schöneberger, Technische Universität Darmstadt, Detlev Runkel, Romax Technology Ltd., Ludwigsburg, Germany

AVL's future hybrid X-mode, a modular transmission family concept
- Compact, power shiftable and modular DHT transmission family
- Modular transmission family for all levels of electrification
- Cost effective transmission family for high production flexibility
- Modular transmission with four variants on one common assembly line

Dipl.-Ing. Ivan Andrasec, Design Engineer Passenger Car Transmission, co-author: Bernd Jeitler, M.Sc., both AVL List GmbH, Graz, Austria

14:45 **Enhancement of a dual clutch transmission kit – Audi S tronic**

- Development of version for all-wheel drive
- Increase of torque and power
- HV-electrification: Integration of EM and clutch K0
- HV-electrification: Modification of hydraulic and torsional vibration isolation

Dr.-Ing. Alexander Schmidt, Head of Development Electrified Dual Clutch Transmission, co-author: Dipl.-Ing. (FH) Hans-Peter Fleischmann, both Audi AG, Ingolstadt, Germany

Holistic approach for fatigue life design of vehicle transmissions

- Fatigue life design of transmission components
- Method of load spectra evaluation
- Holistic procedure model for design and testing
- Method of time-scaled testing

Dipl.-Ing. Michael Hein, Team Leader Flank Load Carrying Capacity, co-authors: Dr.-Ing. Thomas Tobie, Prof. Dr.-Ing. Karsten Stahl, all Forschungsstelle für Zahnräder und Getriebebau (FZG), Technische Universität München, Garching, Germany

Powershiftable 2-speed electric drive unit for light commercial vehicles with short time to market

- Requirements for electric drive units of light commercial vehicles
- Description of transmission architecture and design
- Detailed information about the components and subsystems
- Key factors for a short time-to-market

Dr.-Ing. Gereon Hellenbroich, Department Manager Transmission Design and CAE, co-authors: Dr.-Ing. Ingo Steinberg, Dipl.-Ing. Jürgen Ogrzewallla, all FEV Europe GmbH, Aachen, Germany

Room New York

CVT

Dr. Thilo Leineweber, Robert Bosch GmbH

Room Addis Abeba

Synthesis

Dr. Markus Nussbaumer, BMW Group

Room Nairobi

E-axle

Peter Moelgg, GKN Driveline AG

15:15 **Future Schaeffler CVT concepts with innovative actuation systems**

- Conventional and hybridized CVT
- Compact CVT with small center distance
- Efficiency optimized actuation system for CVT clamping and adjustment
- Simulation regarding CO_2 reduction through 'power on demand' actuation

Dipl.-Ing. Reinhard Stehr, Development Engineer, Advanced Development CVT, co-authors: Dipl.-Ing. Andreas Götz, Dipl.-Ing. Markus Ciesek, all LuK GmbH & Co. KG, Bühl, Germany

Innovative transmission topologies using the example of a P2-hybridtransmission for front-transverse applications

- Hybrid transmission in P2-structure with reduced complexity and six speeds
- Dog shift elements for loss reduction while retaining load shiftability
- Design of one variant for front-transverse applications

Dipl.-Ing. Tom Smejkal, Development Engineer, co-author: Dr.-Ing. Christian Wirth, both ZG GmbH, Eching, Germany

Multi-objective gearbox design optimization for xEV-axle drives under consideration of package restrictions

- Computer-aided method for the design optimization of gearboxes
- System modeling based on established industry standards
- Derives trade-offs regarding costs, efficiency, mass and package integration
- Demonstration on a single-gear helical gearbox with an integrated differential drive

Dipl.-Ing. Martin Hofstetter, Scientific Project Assistant, FTG, Institute for Automotive Engineering, Technische Universität Graz, co-authors: Martin Gintzel, M.Sc., Dr. Andreas Schmidhofer, both MAGNA Powertrain, Austria

15:45 **Coffee break and visit to the exhibition**

16:00 **WM Special: Public Viewing in the exhibition area**

South Korea - Germany

Mexico - Sweden

18:00 **CVT: dedicated to hybrid solutions**

- Concept of a dedicated hybrid CVT system
- Benchmark of modular and dedicated hybrid systems
- Optimizing energy efficiency, performance, packaging and cost

Ing. Gert-Jan van Spijk, Head of Transmission Development, co-authors: Luc Römers, M.Sc., Ing. Mattijs Tweehuysen, all Bosch Transmission Technology B.V., Tilburg, Netherlands

The generic transmission model for hybrid electric drives

- Integration of the dynamic behaviour of all ICE, electric, and hybrid mode types in one model
- Contribution to the development process of hybrid drivetrains
- Practical application: control optimization for arbitrary hybrid electric drives

Wilco van Harselaar, M.Sc., Ph.D, E-Concepts, E-Motor & E-Drives, co-authors: Dipl.-Ing. Markus Brouwer, both Daimler AG, Stuttgart, Germany, Dr. Theo Hofman, Eindhoven University of Technology, Netherlands

Seamless-shift two-speed eAxle with torque vectoring

- Electric Axle with two-shift transmission: High launching torque combined with high maximum vehicle speed
- Power-shift capability for increase of performance and comfort
- Torque-vectoring for increase of vehicle stability and recuperation capabilities
- Efficiency increase due optimized operating possibilities

Dr.-Ing. Dirk Güth, Programme Manager Advanced Engineering, Driveline Systems, co-authors: Dipl.-Ing. Jan Haupt, Dipl.-Ing. Theo Gassmann, all GKN Driveline International GmbH, Lohmar, Germany

18:30 **Development of new torque converter lockup control matched with engine torque management and shift control**

- Adoption of new CVT control for engine downsizing
- Optimized acceleration performance and connected feeling
- Torque converter clutch control matched with D-Step logic

Yasuhiro Endo, Development Engineer, Control System Development Department, co-authors: Akihiro Tanabe, both JATCO Ltd., Kanagawa, Masashi Ono, Nissan Motor Corporation, Japan

Method for automated generation of design concepts

- Automated design concept generation of automatic transmission
- Automated generation of bearing concepts
- Optimization concepts

David Evenschor, M.Sc., Ph.D. Student, Advanced Development Drivetrain - Simulation, co-authors: Dr.-Ing. Dirk Dennin, both BMW AG, Munich, Prof. Dr.-Ing. Peter Tenberge, Ruhr-University Bochum, Germany

Volvo Cars modular electric axle drive

- Volvo Cars electrification strategy
- Electric axle concept
- Volvo Cars test facilities
- Inhouse manufacturing

Mathias Jörgensson, M.Sc., Technical Leader Propulsion Drive & Torque Transfer, co-author: Christian Wolrath, B.Sc., both Volvo Car Group, Göteborg, Sweden

Evening Reception in the former German Parliament

19:00 **Breathe some living German history!**

Visit the assembly hall of the former German Parliament! The nearby Rhine river provides the picturesque backdrop where you can treat yourself with good food while you take in the sounds of some great music! Have a chat with old and new friends or colleagues and meet new contacts in a laid-back atmosphere.

Evening Speech in the former Plenary Hall

19:30 **The Drive of Success**

- Susie's Story - The journey to F1
- You are only as good as the team around you
- Strong leadership
- Coping in a high stress high pressure environment
- Managing change & new technological developments
- Being the best version of yourself
- Performance is power

Susie Wolff, Founder of Dare To Be Different, former F1 Test Driver

2nd Congress Day
Thursday, June 28, 2018

Room New York

Systems
Dipl.-Ing. Georg Bednarek, Opel Automobile GmbH

08:30 From fleet requirements to optimized dedicated hybrid powertrains
- Powertrain technology setup for 2025 and beyond
- Hybridization scenarios for a complete vehicle fleet
- CO_2- and cost-optimal mass electrification
- Unified platform components for HEV, PHEV and EV

Dr.-Ing. Christoph Danzer, Development Engineer, Powertrain Concepts, co-authors: Dipl.-Ing. Tobias Voigt, Dipl.-Math. Techn. Tobias Guenther, Dr.-Ing. Ralf Tröger, all IAV GmbH, Stollberg, Germany

09:00 Transmission technology contribution to CO_2 roadmap – a benchmark
- Transmission loss and fuel consumption benchmark for DCT, AT, CVT
- Which technology is ahead regarding fuel consumption?
- CO_2 potentials of next generation DCT
- Potentials for upgraded DCT to dedicated hybrid powertrains - DHP

Martin Bahne, Attributes & Technical Excellence Attributes, GETRAG International GmbH, Magna Powertrain, Cologne, Germany

09:30 Hybridization of manual transmission drivetrains
- Basic variant with MTplus und P0 12 V
- Clutch-by-wire with P0 12 V
- ECM (2-pedal) with P0 12 V or 48 V

Dipl.-Ing. (FH) Markus Kneißler, Head of Development Automated Clutches, co-authors: Dr. Roland Welter, Dipl.-Ing. (FH) Matthias Baumann, all LuK GmbH & Co. KG, Bühl, Germany

Room Addis Abeba

Transmission manufacturing
Dipl.-Ing. Hans-Peter Fleischmann, AUDI AG

"Friction Stir Welding" - The path from a concept to revolutionary gearbox manufacturing
- Joining of gearbox housings using welding technology
- Effect of the housing joining method to the gearbox design
- Capable design for an boltless axle drive

Dipl.-Ing. (FH) Alexander Dietrich, Head of Group Component Process Development Mechanics, co-author: Dipl.-Ing. Dr. Heinz Klampfl, both MAGNA Powertrain, Lannach, Austria

3D-metall printing – Chances and challenges in the automotive environment
- What is needed to make 3D metal printing to become a pioneer for the automotive industry?
- Specific automotive examples
- Technological and economic challenges
- Assessment and perspectives

Dipl.-Ing. (FH) Heinrich Dismon, Chief Technology Officer Rheinmetall Automotive AG, co-authors: Dipl.-Wirtsch. Ing. (FH) Benedikt Szukala, Stefan Pförtner, Dipl.-Ing. (FH) Ralf Dahmen, all Solidteq GmbH, Neuss, Germany

Industrie 4.0 in the automatic transmission production
- Network and physical cyber systems
- Virtual Launch/Implementing
- Big Data Analytics
- Technical Assistance
- Working with 4.0

Dipl.-Ing. (FH) Klaus-Peter Fritsch, Senior Manager Plant Systems and Processes, Car Powertrain Technology, Production Automatic Transmissions, ZF Friedrichshafen AG, Saarbrücken, Germany

Room Nairobi

Hybrid modules
Dipl.-Ing. Matthias Zink, Schaeffler AG

HEV P2 module concepts for different transmission architectures - Clutch and E-motor options
- P2 module comparison in respect to on-axis and off-axis arrangements
- Discussion of different disconnect clutch options
- Discussion of different e-motor options

Dipl.-Ing. Eckhart Gold, Senior Manager Advanced Engineering DCTS TS, BorgWarner Drivetrain Engineering GmbH, Ketsch, Germany and **Csaba Vari,** BorgWarner, Landskrona, Sweden

The new plug-in hybrid module as an extension of the AUDI S tronic transmission generation
- P2 Plug-in hybride module
- Highly integrated system components
- Development goals: Maximum efficiency and maximum power density
- New manufacturing methods for stator and rotor

Dipl.-Ing. Jakob van der Meer, B.A., Technical Projectleader, Development Electrical Machine, co-authors: Dipl. Ing.(FH) Götz Hangen, both Volkswagen AG, Baunatal, Jürgen Uhlig, B.Eng., Audi AG, Ingolstadt, Germany

Fast and efficient clutch coordination control application in P2 hybrid transmission systems
- Realizing complex shifts for improving transmission performance
- The importance of hysteresis and response influences existing in hydraulic systems
- Requirements on torque priority control, gear shift priority control and clutch parallel control
- Continuous, stable and fast shifting processes by complex gear shift control processes

Dr. Wei Guo, Manager of Software Development Department, co-authors: Shuhan Wang, both Beihang University & Shengrui Transmission Corporate Limited, Shandong, China, Mick Jordan, M.Sc., Ruhr-University Bochum, Germany

10:00 Investigation of gear shifts in a parallel-series hybrid powertrain with dog clutches at a powertrain test bench

- Development of an innovative parallel-series dedicated hybrid powertrain
- Gear shifts and mode changes using dog clutches
- Commissioning and testing of the transmission control unit at a powertrain test rig
- Discussion about the evaluation of shifting comfort

Andreas Viehmann, M.Sc., Research Assistant, Vehicle Systems, co-author: Ruben König, M.Sc., Prof. Dr.-Ing. Stephan Rinderknecht, all Institut für Mechatronische Systeme im Maschinenbau (IMS), Technische Universität Darmstadt, Germany

How does Additive Manufacturing influence automotive component design and the factory of the future?

- Further development of rapid prototyping applications towards production
- High quality and cost-efficient metal and plastic applications achieved by significant technological progress
- Examples of additional manufacturing processes in different industries, including the automotive sector
- Additional manufacturing processes in the future factory
- Realisation of transmission applications

Dipl.-Ing. Nikolai Zaepernick, MBA, Senior Vice President Central Europe, Electro Optical Systems GmbH, Kraling, Germany

Hybrid actuation needs: Energy consumption efficient electro-mechanical clutch actuator

- Hybrid architectures with disconnecting clutch (dry or wet type)
- Enabler for manual transmission hybridization
- Clutch actuators typologies
- New clutch actuator concept – Performance to efficiency
- Actuator energy efficiency comparison on RTE & WLTP

Pascal Maurel, Transmissions Systems, Control Laws and eActuation Manager, co-author: Norberto Termenon, both VALEO - Powertrain Systems, Amiens, France

10:30 Coffee break and visit to the exhibition

Panel discussion in the plenary hall New York

11:15 Urban Mobility 2030 caught between political, societal and technological objectives

Moderation:
Guido Reinking, Journalist

Panelists:

„Mobility plays a key role for us as manufacturer as well as user. We don't see individual modes of transport entering a competitive struggle but rather a necessary interplay (co-modality) of all modes of transport that needs to be in place as a key for a well-functioning transport infrastructure."
Gunnar Herrmann, Vice President Quality and Chairman of the Management Board, Ford-Werke GmbH, Germany

„At the moment, electrification and autonomous driving are changing the streetscape as we know it, allowing new business models for private transport to arise. We as engineers are challenged to otimise these new technologies in terms of vehicle attributes as well as make sure that they remain affordable."
Prof. Dr. Uwe-Dieter Grebe, Global Business Development, Sales and International Operations Passenger Cars and Powertrain Systems, AVL List GmbH, Austria

„The Internet has not only gone deep into everyone's daily life, but also in conjunction with automotive industry. To adopt the Internet thinking into automotive industry will bring the customer superb experience beyond expectation."
Dr. Charles Huang, VP-E Powertrain, NIO, China

„In 2030 urban mobility will be different to what we are commonly experiencing today. Future mobility will be electric and partly autonomous. In addition, it will curtail the MIT's habits of moving around as they please."
Toralf Müller, Managing Director, Verkehrsbetriebe Hamburg-Holstein GmbH, Hamburg, Germany

„In order to achieve the climate targets, the automobile needs to be part of the shift from fossile fuels to clean sources of energy. It is of questionable environmental integrity and from a economical perspective highly precarious to just rely on one type of drive technology."
Reinhard Otten, Strategy Climate and Ressource Protection, Audi AG, Ingolstadt, Germany

12:45 Lunch and visit to the exhibition

Room New York

Components

Dipl.-Ing. Volker Heinz,
BorgWarner Drivetrain Engineering GmbH

14:15 Low friction and low viscosity oils: solutions for F.E. performance developed in order to reduce the torque loss in the final drive unit

- Developed final drive oil concept (balance between low viscosity and countermeasure against negative impact)
- Evaluation method of final drive oil (to define market applicability)
- Result and correlation (F.E. performance improvement and prove correlation between dyno and actual vehicle condition)

Tadashi Nishikawa, Design Manager, Engine and Transmission Engineering Department, co-author: Tomoo Kubo, both Nissan Motor Co. Ltd., Kanagawa, Japan

14:45 TorqueLINE: Thermo-mechanical stability of cone clutches for automatic transmissions

- Cone clutches with form fit for automatic transmissions
- Thermo-mechanical finite element analysis of synchronization processes and experimental validation
- Thermal stability of cone clutches subjected to high loads

Marco Mileti, M.Sc., Project Manager electro-mechanical Drivetrain, co-authors: Dr.-Ing. Hermann Pflaum, Prof. Dr.-Ing. Karsten Stahl, all Lehrstuhl für Maschinenelemente – Forschungsstelle für Zahnräder und Getriebebau (FZG), Technische Universität München, Garching, Germany

15:15 Potential of lightweight design of a vehicle transmission by usage of high strength steels

- Lightweight construction of transmission based on material substitution
- Use of high-strength steels
- Demonstrating the lightweight construction potential in terms of mass, inertia and assembly space
- Potential shown by a hybrid transmission as well as a truck transmission

Felix Busch, M.Sc., Scientific Assistant, Drive Systems, co-authors: Dipl.-Ing. Sascha Ott, Dipl.-Ing. Katharina Bause, all Karlsruher Institut für Technologie KIT, Karlsruhe, Germany

15:45 Awarding of the best presentation award for junior engineers

16:00 Closing remarks and end of the congress

Room Addis Abeba

Simulation

Dipl.-Ing. Gerd Bofinger, Dr. Ing. h.c. F. Porsche AG

Neural net based driver model for powertrain control and calibration optimization

- Powertrain system simulation
- Neutral net based driver model development
- Drive style index
- Control and calibration optimization for FE and performance

Hong Jiang, Department Manager, Transmission, Driveline and P/T as-installed Research & Advanced Engineering, Ford Motor Company, Dearborn, Michigan, USA

Torque opediction in vehicle drive trains based on bus signals using artificial neural networks (ANN)

- Virtual torque sensing using an ANN
- Derivation of a representative set of data, covering all relevant perturbations
- Investigation of the proposed approaches range of validity in terms of possible perturbations

Jan-Michael Veith, M.Sc., Doctoral Student, Integration and Evaluation Drivetrain, co-authors: Bastian Krüger, B.Sc., both Dr. Ing. h.c. F. Porsche AG, Weissach, Univ.-Prof. Dr.-Ing. Dr. h. c. Albert Albers, Institut für Produktentwicklung am Karlsruher Institut für Technologie, Karlsruhe, Germany

Shift simulator for shiftability development of manual transmissions

- Mechanical design of shift simulator
- Usage within Opel transmission development
- Simulation model
- Correlation to shiftability feeling in vehicle

Dipl.-Ing. (FH) Joachim Hofmann, Project Leader RLM, Opel Automobile GmbH, Rüsselsheim, Germany and
Dipl.-Ing. Philip Clarenc, Siemens Industry Software S.A.S. Lyon, France

Room Nairobi

48V Systems

Dr. Uwe Keller, Daimler AG

Advanced powertrain functions of 48V hybrid vehicles

- 48 V mild hybrid system in high performance sports car
- Electric supercharging
- P0 hybrid architecture
- Fuel economy and driving pleasure

Dipl.-Ing. Rene Savelsberg, Team Leader, Hybrid System, co-authors: Dr.-Ing. Georg Birmes, Dipl.-Ing. Andreas Sehr, all FEV Europe GmbH, Aachen, Germany

48 Volt Torque Vectoring Electric Rear Drive Module (eRDM)

- Realization of the torque vectoring element through a P3 HEV architecture with modular functionality
- Flexible use of the system (torque vectoring mode, hybrid mode etc.)
- Combination of excellent driving dynamics by torque vectoring via direct 48V electric motor control with significant CO_2 savings by 48V hybridization
- Optimized controllability and efficiency by utilization of an electrical machine for the torque vectoring function

Tua Högnäs, M.Sc., System Project Leader, Electric Drive Modules, co-author: Gabriel Beldie, both BorgWarner, Landskrona, Sweden

Thermal behavior of 48V hybrid systems

- Presentation of the modular simulation model
- Thermal modelling of electric components in 48V powertrains
- Simulation results regarding the thermal stress
- Statements regarding the suitability of the electric components for different 48V powertrain topologies

Matthias Werra, M.Sc., Research Assistant, Hybrid and Electric Drives, Requirement Engineering, co-author: Arno Ringleb, M.Sc., both Institut für Fahrzeugtechnik, Technische Universität Braunschweig, Germany

Free of charge for the participants of the Congress "Drivetrain for Vehicles"

Room Bangkok

5th International Congress
„Transmissions in mobile machines“

June 27 and 28, 2018, World Conference Center Bonn

Main topics:
- Visions and vehicle concepts in agricultural and construction machinery, including those of the winner of the German Environmental Award 2017
- Current drive and transmission concepts of the OEMs, TIER 1 suppliers and universities
- Opportunities and limitations entailed with the electrification of the powertrain
- Systems: Needs and challenges in daily practice
- Topologies: Solutions to handle complexity
- Consequences on the drive and transmission development in agricultural and construction machinery going along with digitisation
- Global vs. regional transmission and drive development in the off-highway industry - quo vadis?

Chairman:

Prof. Dr. Ludger Frerichs, Head of Institute for Mobile Machines and Commercial Vehicles, TU Braunschweig, Germany

With lectures held by:
AGCO Fendt | AVL | BHF | Caterpillar | IAV | John Deere | Liebherr | LiuGong | MAN | Oswald Elektromotoren | Oerlikon | RWTH Aachen | TU Braunschweig | ZF Friedrichshafen

For the current program and more details, please visit
www.vdi-wissensforum.de/en/event/getriebe-mobile-arbeitsmaschinen/

Room Wien

International VDI Congress
„EDrive“

June 27 and 28, 2018, World Conference Center Bonn

Main topics:
- Challenges posed by system optimization
- Power electronics and battery
- Integration of the e-machine
- Transmission topologies for electrified powertrains
- E-axles
- Hybrid modules
- 48V Systems

Chairman:

Dr. Andreas Schamel, Ford-Werke GmbH, Aachen , Germany

With lectures held by:
Bosch | Danfoss | FEV | Ford | IAV | Magna | Semikron | Silver Atena | Valeo | Volkswagen | Volvo

For the current program and more details, please visit
www.edrive-congress.com

Special exhibition
EDrive

Workshops will only held in German

VDI Wissensforum

Dritev – Drivetrain for Vehicles

Anmelden unter: www.dritev.com

Kupplungen für elektrifizierte und hybride Antriebssystemlösungen

9.00 – ca. 17.00 Uhr (02ST135001)

Ihre Leitung: Dipl.-Ing. Sascha Ott, Mitglied der Institutsleitung und Geschäftsführer, IPEK – Institut für Produktentwicklung, Karlsruher Institut für Technologie (KIT), **Dr.-Ing. Kristin Sittig,** Leitung Erprobung Antriebsmodule und Tribologie, Entwicklung Geschäftsfeld Getriebe, Volkswagen AG, Kassel

Zielsetzung:

Der Spezialtag zeigt die sich verändernden Anforderungen an Kupplungssysteme durch die Elektrifizierung von Antriebssystemen auf. Auf Basis komplexer Modellvorstellungen lernen Sie das Erfahrungswissen aus konventionellen Antriebssystemen auf neue hybride und vollelektrische Anwendungen zu übertragen. Die Grenzen der Anwendbarkeit bestehender Vorgehensweisen werden genauso angesprochen, wie die Trends bzgl. des Einsatzes von Kupplungen in alternativen Antriebssystemlösungen. Die Basis für diese Betrachtungen bildet dabei ein fundierter Überblick über den aktuellen Stand der Technik und der Forschung an Kupplungssystemen.

Inhalte des Spezialtages

- Struktur und Aufbau elektrifizierter Antriebe - Übersicht und Synthese
- Bedeutung der Kupplung in aktuellen und zukünftigen elektrifizierten Anwendungen
- Auslegungsgrundlagen von Fahrzeugkupplungen
- Änderungen der Auslegungsrandbedingungen durch Elektrifizierungsansätze
- Einflussgrößen bei der Kupplungsauslegung durch hybride Betriebsmodi
- Einflüsse von Kupplungsschwingungen und Regelbarkeit auf die Hybridisierung

Hochvolt-Sicherheit an elektrifizierten Fahrzeugen

9.00 – ca. 17.00 Uhr (01ST017001)

Ihre Leitung: Dipl.-Ing. Andreas Brozowsky, Sachverständiger für Hochvoltfahrzeuge und Hochvoltenergiespeicher, Ingenieurbüro Jansen, Köln

Zielsetzung:

Die Sicherheitsanforderungen an elektrisch bzw. teilelektrisch fahrende Automobile sind deutlich höher als bei herkömmlichen Fahrzeugen. Sie erlangen in diesem Workshop einen ganzheitlichen Überblick zu den Herausforderungen und rechtlichen Vorschriften im Umgang mit diesen Systemen. Dabei geht es darum, die Anforderungen im späteren Lebenszyklus (z.B. an die Wartung und Instandhaltung, aber auch bei Unfällen) dieser Fahrzeuge unter HV-Aspekten zu verstehen und zu berücksichtigen.

Inhalte des Spezialtages

- Fach- und Führungsverantwortung
- Arbeitsschutzsysteme – Gesetze und Vorschriften
- Gefahren des elektrischen Stromes
- Schutzmaßnahmen für elektrische Systeme
- Technische Sicherheitsmaßnahmen bei HV-Fahrzeugen
- Maßnahmen bei der Fehlersuche an „unter Spannung stehenden" Teilen
- Lithium-Ionen Energiespeicher (Aufbau, Umgang, Gefährdungspotential)

Electric Vehicle und DHT-Antriebsstränge - Herausforderungen in der Entwicklung

9.00 – ca. 17.00 Uhr (01ST012001)

Ihre Leitung: Dr. Jörg Müller, Teamleiter Vorentwicklung Hardware Getriebe und Hybridsysteme, IAV GmbH, Stollberg und weitere

Zielsetzung:

Die Zukunft gehört dedizierten Hybridgetrieben (Dedicated Hybrid Transmission, DHT), die speziell für elektrifizierte Antriebsstränge ausgelegt sind. Sie sind sowohl technisch als auch wirtschaftlich die bessere Option, weil bei ihnen die E-Maschine geometrisch und funktionell viel stärker in das Getriebe integriert ist. Das ermöglicht wichtige Synergieeffekte. Betrachten Sie in diesem Workshop die Herausforderungen bei der Entwicklung dieser Antriebe aus verschiedenen Blickwinkeln. Erfahren Sie, welche Ansätze und Zielsetzungen bei der Optimierung zugrunde liegen und kommen Sie in den Austausch mit den Fachexperten aus den verschiedenen Entwicklungsbereichen.

Inhalte des Spezialtages

- Flottenanforderungen für DHT-Getriebe
- Getriebekonzepte für DHT und EV: Virtualisierung und Automatisierung in der Vorentwicklung
- Optimierung elektrischer Maschinen für Fahrzeuganwendungen
- Virtuelle NVH-Bewertung elektrischer Antriebsstränge im Entwicklungsprozess
- Systematischer Entwicklungsprozess von Aktoriksystemen für EV- und DHT-Antriebsstränge
- Virtuelle Absicherung der Software für EV- und DHT-Antriebsstränge
- Steuerung komplexer Multi-Mode-DHT-Systeme durch Transformation

EMV im elektrifizierten Antriebsstrang

9.00 – ca. 17.00 Uhr (01ST179001)

Ihre Leitung: Dr.-Ing. Sebastian Jeschke, Teamleitung F&E Elektromobilität, EMC Test NRW GmbH, Dortmund und weitere

Zielsetzung:

In der Entwicklung des elektrifizierten Antriebsstrangs spielt die elektromagnetische Verträglichkeit eine entscheidende Rolle, die häufig unterschätzt wird. Dabei nimmt sie entscheidenden Einfluss auf Auslegung und Anordnung von mechanischen, mechatronischen und elektronischen Komponenten. Der Spezialtag möchte vor allem maschinenbaugeprägten Antriebs- und Getriebeentwicklern aufzeigen, wie die Zusammenhängen sind und was bei der Antriebskonzeptionierung zu beachten ist.

Inhalte des Spezialtages

- Motivation: Warum ist die EMV im elektrifizierten Antriebsstrang von so großer Bedeutung? (Einflussfaktoren, HV-Komponenten, Spannungsebenen, Überkopplung)
- Herausforderung: Welche EMV-Aspekte ergeben sich durch die Elektrifizierung? (Störspannungen, Störfestigkeit, Störemissionen, Schirmdämpfung etc.)
- Normung: Welche gesetzlichen und normativen Vorgaben sind zu beachten?
- Lösung: Wie und unter welchen Rahmenbedingungen können die EMV-Anforderungen überprüft und eingehalten werden? (EMV-Messungen nach ECE R10 Edition 3, 4 und 5 sowie nach Herstellerspezifikationen und CISPR 25, Annex K etc.)

The exhibition - The central market place

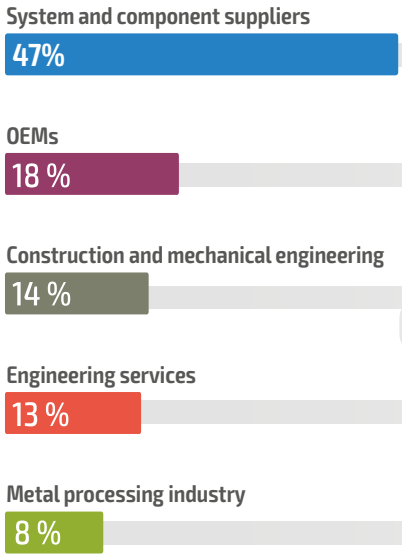
Dritev, the international congress of drivetrain experts, is one of the the world's best specialist congress for transmission engineering. Illustrating the whole supply chain for drivetrains in mobile applications (passenger cars, commercial vehicles, mobile machines) the exhibition becomes a cross-industry information platform for requirements on transmission and powertrain (conventional transmissions, hybrid concepts, electrified drivetrains).

If you want to meet with and reach out to the first-rate experts attending this VDI congress and to powerfully present your products and services to the well-informed community of conference participants, please contact:

Your contact person:
Christoph Brockerhoff
Project Consultant Exhibitions & Sponsoring
Phone: +49 211 6214 - 228
Fax: +49 211 6214 - 167
Email: brockerhoff@vdi.de

The participants – Your customers

Attendees by company type in 2017



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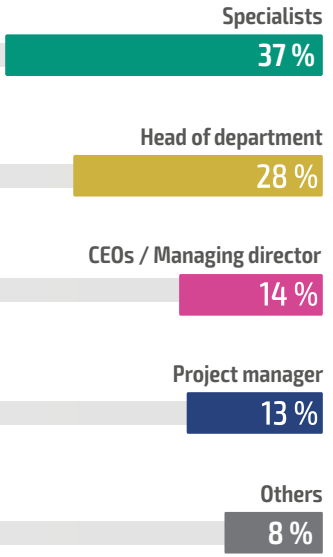

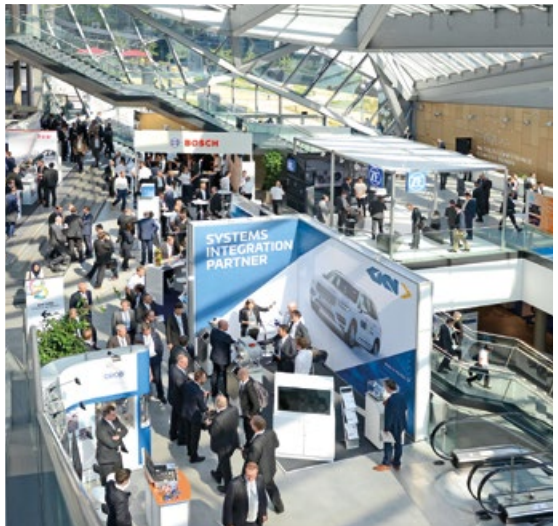

Mobility Solutions is the largest Bosch Group business sector. According to preliminary figures, its 2017 sales came to 47.4 billion euros, or 61 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector combines the group's expertise in three mobility domains – automation, electrification, and connectivity – and offers its customers integrated mobility solutions. Its main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and auto- mated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

Contact
Robert Bosch GmbH | P.O. Box 10 60 50 | 70049 Stuttgart, Germany |
Phone: +49 (0) 711 811 8202 | Fax: +49 (0) 711 811 518 8202 | Email: kontakt@bosch.de |
Internet: www.bosch.com | www.bosch-press.com, twitter.com/BoschPresse

Magna Powertrain, an operating group of Magna International, is a premier supplier for the global automotive industry with full capabilities in powertrain design, development, testing and manufacturing. Complete system integration sets us apart from our competitors. To address increasing environmental pressures, many of Magna Powertrain's innovations focus on electronically controlled technologies, supporting the quest for improved efficiency and reduced emissions.

Magna Powertrain c/o GETRAG | Hermann-Hagenmeyer-Straße | 74199 Untergruppenbach, Germany |
Phone: +49 (0) 713 164 440 | Fax : +49 (0) 713 164 435 65 | Email: anna-sophie.kreis2@magna.com |
Internet: www.magna.com

ZF is a global leader in driveline and chassis technology as well as active and passive safety technology. The company has a global workforce of around 140,000 with approximately 230 locations in some 40 countries. In 2017, ZF achieved sales of about €36 billion. ZF annually invests about 6 percent of its sales in research and development – ensuring continued success through the design and engineering of innovative technologies. ZF is one of the largest automotive suppliers worldwide.

Contact
ZF Friedrichshafen AG | Graf-von-Soden-Platz 1 | 88046 Friedrichshafen, Germany |
Phone: +49 (0) 754 177 0 | Fax: +49 (0) 754 177 908 000 | Email: postoffice@zf.com |
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Castrol is the lubricant specialist within the BP Group - one of the leading global oil companies. With more than 100 years experience in the development and production of lubricants Castrol is a partner of many passenger car, commercial vehicle and transmission / axle manufacturers and stands for leading technology, competence, innovation and premium product qualities. Castrol is - often as a market leader - represented in more than 140 countries worldwide with a very strong brand awareness. Within the Global Driveline Technology Centre in Hamburg Castrol is developing high performance driveline lubricants in close co-operation with leading international OEM's. In a tight network with their blend plants Castrol is producing transmission fluids and setting global milestones due to its innovative production processes. For keeping the technical standards and production capabilities at its highest level the ISO/TS 16949 certification is a clear pre-requisite.

Contact
BP Europa SE Lubricants International | Überseeallee 1 | 20457 Hamburg, Germany |
Phone: +49 (0) 406 395 5389 | Email: kundenservice@castrol.com | Internet: www.castrol.com

GKN Driveline is the world's leading automotive driveline technology and systems engineer. As a global company serving the world's leading vehicle manufacturers, GKN Driveline designs, develops, manufactures and integrates an extensive range systems for use in the smallest ultra low-cost car to the most sophisticated and dynamic premium vehicle. As a vehicle optimisation specialist, GKN helps OEMs define the way a vehicle drives whether two wheel drive, all wheel drive, hybrid or pure electric. GKN Driveline is a leading global producer of CVJ Systems, AWD and eDrive Systems and operates in 23 countries at 46 locations employing approximately 25,500 people.

Contact
GKN Driveline | Hauptstraße 130 | 53797 Lohmar, Germany | Phone: +49 (0) 224 610 022 65 |
Fax +49 (0) 224 610 022 93 | Email: info@gkndriveline.com | Internet: www.gkndriveline.com

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Internet: www.kokitransmission.com

Exhibitor list 2018

(April 2018):

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Altair Engineering GmbH
Aluwag AG
Arnold Umformtechnik GmbH & Co. KG
ATESTEO GmbH
AVL List GmbH
BorgWarner Transmission Sytems
Brose Fahrzeugteile GmbH & Co.
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ZF Friedrichshafen AG
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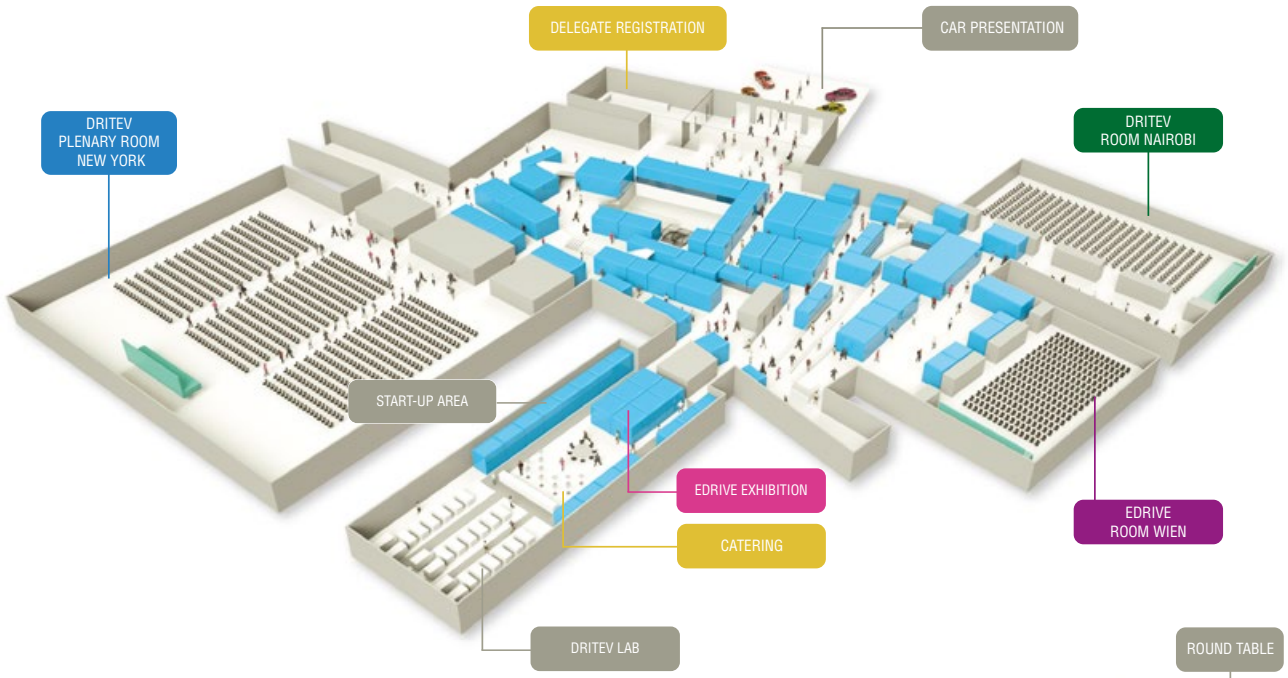
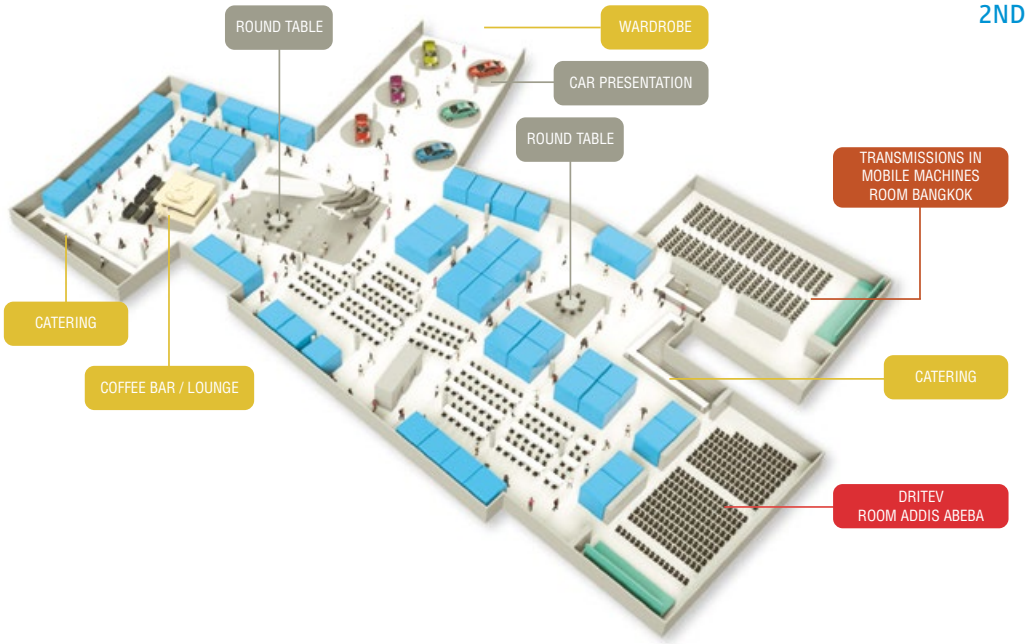
The current list can be found below www.vdi-wissensforum.de/en/dritev/exhibition-and-sponsorship/

Exhibition Areas

1ST LEVEL



2ND LEVEL



Special Exhibition „EDrive“

In light of the growing electrification in the powertrain, first and foremost all components from the field of electronics, semi-conductors, software and e-motors play a key role.

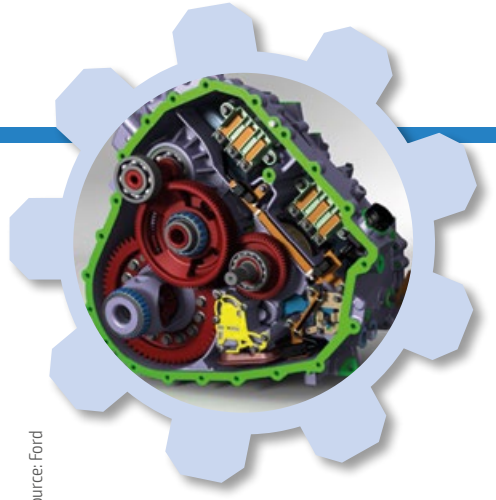
At the special exhibition „EDrive“ meet those businesses, that form a crucial part along the value-added-chain in these fields.

Learn more about the players! Extend your network!

ZF Electric Innovation Challenge

Calling all startups, agile companies and colleges.

You are creative, have innovation-driven ideas and work with passion and energy on subjects related to e-mobility?
We have an exciting challenge for you!
Share your ideas and solutions with us at our pitch event „Electric Innovation Challenge".
A jury of representatives from the ZF E-Mobility Division will choose the most innovative ideas and give you the opportunity to realize it as a prototype collaboratively with ZF.
In addition, you will also be given the opportunity to present your ideas as a company at the VDI Congress „Dritev - Drivetrain for Vehicles". All details and application forms can be found at www.zf.com/e-innovation



Source: Ford

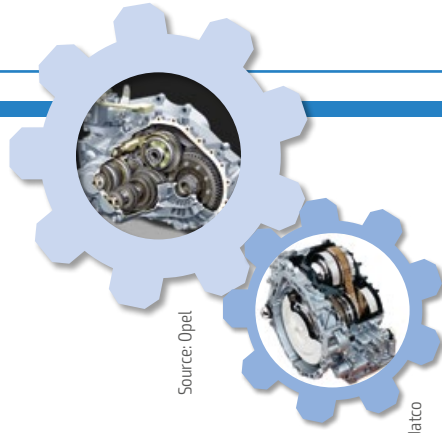
Dritev Lab

Gain first-hand experience in the transmission world !

Have a close look at specific transmission parts, get an overview of how the various components work together and compare design and workmanship!

The following transmissions will be on display, stripped down into assembly units:

- Opel 6-Speed MT „M1X"
- Ford FWD 6 Speed Planetary Automatic Transmission
- Jatco CVT 8 High Torque
- Ford FWD Hybrid Transmission



Source: Opel

Source: Jatco

Round Tables

Discuss with the experts those questions that fuel the current debate in the industry:

- E-drives in the next decade: To what extent can electromobility be reasonably scaled to fit the needs arising until the year 2030?
- The combustion engine – is it only a momentary contributing factor? What's its future role?
- E-motors: What potential lies in new materials and manufacturing processes?
- High voltage wiring system: What's the appropriate voltage level? Where are the limits?
- Power semiconductor: When is the right time to switch from silicon to silicon carbide?
- Change in mindset: How should drive development be addressed in future?

Share your thoughts and views, gain an insight of the current status and liaise with international experts!

VDI Society Product and Process Design

The VDI Society Product and Process Design (VDI-GPP) and its technical divisions provide all sectors with verified knowledge on the design of products and processes and their optimization in terms of quality and the time- and cost-benefit ratio. This verified knowledge covers the entire product lifecycle, from the product idea and product development, marketing and service to recycling using optimized methods, tools and systems, including the necessary information technology. This ensures the successful connection of market and technology for the purpose of sustainable growth and profit. The VDI-GPP – as the largest technical division in the VDI – provides a platform for specialist discussion and cooperation ranging from the technological state of the art and continuous improvement to trends in development. The task of the VDI-GPP is to concentrate the extensive range of services of the VDI in these fields, display them in summary and constantly improve them. This also includes the lively exchange of ideas with other VDI societies.

The activities of the society are planned and coordinated by an advisory board staffed with decision- makers working on an honorary basis. The secretariat is located in the VDI building in Düsseldorf. Besides the main secretariat, the regional chapters, which take care of the VDI members in their own areas, include work groups active in the field of product and process design.

VDI Society Automotive and Traffic Systems Technology

The VDI Society for Vehicle and Transport Technologies, VDI-FVT in short, has around 28,000 members that are affiliated to at least one of its 8 technical sections. This makes it the second biggest of the VDI's dedicated societies. VDI-FVT is the community for engineers working in the vehicle industry, as well as for engineers dealing with transport and traffic outside manufacturing industries.

Traditionally, a majority of members work in automotive. VDI-FVT is the German affiliate of the world federation of automotive engineers' societies, FISITA, and it is the intellectual sponsor of many big conferences on automotive technology and thus fosters exchange and knowledge transfer both nationally and internationally. It also sponsors Formula Student Germany, awarding VDI membership to all German participants, and promotes other student competitions for transport engineers. VDI-FVT has recently reconstituted technical sections for rail and marine technologies, as well as space- and aircraft. It is putting a strong focus on transport and traffic in general and aims to mediate between technology and society.

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The brains behind the Congress - The Program Committee

Highly committed and with great passion to succeed, the program committee - consisting of 20 experts from industry and research - draws up the congress agenda every year.
In terms of lectures they lay particular emphasis on high quality, profound technical expertise and degree of innovation – which is quality management at the highest level.

Dipl.-Ing. Dirk Adamczyk, Head of Corporate Research and Development ZF Friedrichshafen AG, Friedrichshafen, Germany

Dipl.-Ing. Georg Bednarek, Global Program Manager and Global Chief Engineer Purchased Automatic Transmissions, Opel Automobile GmbH, Rüsselsheim, Germany

Dipl.-Ing. Gerd Bofinger, General Manager Transmission Development, Dr.-Ing. h.c. F. Porsche AG, Weissach, Germany

Dr. Carsten Bünder, Director Global Product Management, GETRAG Magna Powertrain, Untergruppenbach, Germany

Dipl.-Ing. Hans-Peter Fleischmann, Director Dual Clutch Transmission Development and Series Support Transmission, Audi AG, Ingolstadt, Germany

Dipl.-Ing. Volker Heinz, Director, Engineering, DualTronic® and Clutch Systems, BorgWarner Drivetrain Engineering GmbH, Ketsch, Germany

Dipl.-Ing. Gerald Hilpert, VDI Society of Product and Process Design, The Association of German Engineers (VDI e.V.), Düsseldorf, Germany

Prof. Dr.-Ing. Bernd-Robert Höhn, Retired Professor at the Institute for Machine Elements/FZG, Technische Universität München, Garching, Germany

Dr. Uwe Keller, Director Transmission & Drivetrain, Mercedes-Benz Cars Development, Daimler AG, Stuttgart, Germany

Thomas Landsherr, Vice President, Engineering Driveline Truck & Bus, MAN Truck & Bus AG, Munich, Germany

Dr. Thilo Leineweber, Senior Vice President Gasoline Systems Transmission Control, Robert Bosch GmbH, Schwieberdingen, Germany

Peter Moelgg, CEO AW&E Drive, GKN Driveline AG, Bruneck, Italy

Dr.-Ing. Florian Mulzer, AGCO Transmission Specialist, AGCO GmbH, Marktoberdorf, Germany

Dr. Markus Nussbaumer, Head of Longitudinal Transmissions, Advanced Development, BMW Group, Munich, Germany

Prof. Dr.-Ing. Stephan Rinderknecht, Full professor and Head of the Institute for Mechatronic Systems in Mechanical Engineering, Technische Universität Darmstadt, Germany

Dipl.-Ing. Michael Schäfer, Head of Transmission Development, Volkswagen AG, Wolfsburg, Germany

Prof. Dr.-Ing. Karl Viktor Schaller, Executive Vice President Development, BMW Motorrad, BMW Group, Munich, Germany (Honorary Member)

Dr. Andreas Schamel, Director Global Powertrain Research & Advanced, Ford-Werke GmbH, Aachen, Germany

Prof. Dr.-Ing. Karsten Stahl, Full Professor and Director of the Institute for Machine Elements/FZG, Technische Universität München, Garching, Germany

Prof. Dr.-Ing. Peter Tenberge, Director, Head of Chair of Industrial and Automotive Drivetrains, Ruhr-University Bochum, Germany

Dipl.-Ing. Matthias Zink, CEO Automotive, Schaeffler AG, Bühl, Germany (Chairman)

Dritev

International VDI Congress

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International VDI Congress „Dritev - Drivetrain for Vehicles“	International VDI Congress „Transmissions in mobile machines“	International VDI Congress „EDrive“
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EUR 1.640,–	EUR 1.640,–	EUR 1.640,–

VDI workshop 1 „Kupplungen für elektrifizierte und hybride Antriebssystemlösungen“	VDI workshop 2 „Hochvolt-Sicherheit an elektrifizierten Fahrzeugen“	VDI workshop 3 „EMV im elektrifizierten Antriebs-strang“	VDI workshop 4 „Electric Vehicle und DHT“
- only held in German -			
☐ **26. Juni 2018** (02ST135001)	☐ **26. Juni 2018** (01ST017001)	☐ **26. Juni 2018** (01ST179001)	☐ **26. Juni 2018** (01ST012001)
EUR 1.040,–	EUR 1.040,–	EUR 1.040,–	EUR 1.040,–

☐ Package Price Congress + Workshop 1, 2, 3 or 4 = **EUR 2.190,–**

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Participants with an invoice address outside of Austria, Germany and Switzerland are kindly requested to pay by credit card. Please don't send your credit card details via email, fax or post. Please book your ticket at www.vdi-wissensforum.de. Transferring your credit card details via our website ensures your details are encrypted and security of your data is guaranteed.

Venues:
Congress: World Conference Center Bonn, Platz der Vereinten Nationen 2, 53113 Bonn, Germany
Phone: +49 228 9267 0, E-Mail: info@worldccbonn.com
Workshops: Hilton Bonn, Berliner Freiheit 2, 53113 Bonn, Germany, Phone: +49 228 7269 0,
E-Mail: info.bonn@hilton.com
Accommodation
A limited number of rooms have been reserved for the benefit of the congress participants.
A reservation form can be found at www.dritev.com

More Hotels close to the conference venue may be found via our HRS service
www.vdi-wissensforum.de/hrs

HRS Das Hotelportal

Information The price includes the compendium, coffee breaks, beverages during breaks, lunches and the evening reception (congress).
Workshops: The price includes beverages during breaks and lunch. The participants get the compendium at the venue.

Exclusive offer: All participants at this event are entitled to a free three-month trial VDI membership. (Offer applies exclusively to new members.)

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