5th International VDI Congress

Transmissions in mobile machines
Marketplace Transmission: It’s the first time this Off-Highway industry event is held in Bonn!

Top Topics:

- Future drive systems in agricultural and construction machinery, including the winner of the German Environmental Award 2017
- Current drive and transmission concepts of OEMs, TIER I suppliers and universities
- Opportunities and restrictions posed by electrified powertrain
- Systems and topologies: needs and challenges in practice
- Digitisation 4.0 in drive and transmission development

Congress Chairman
Prof. Dr. Ludger Frerichs, Head of Institute for mobile machines and commercial vehicles, TU Braunschweig (Germany)

Listen to experts from:

AGCO | AVL | BFH | Caterpillar | IAV | John Deere | Liebherr | LiuGong | MAN |
Oswald Elektromotoren | Oerlikon | RWTH Aachen | TU Braunschweig | ZF Friedrichshafen

Parallel international events
Ditev – „Drivetrain for vehicles“
EDrive

Panel
Global vs. regional transmission and drive development in the Off-Highway industry

Exhibition

Simultaneous translation: German - English
1st Congress day
Wednesday, 27 June, 2018

07:30 Registration
08:30 Welcome by (Room New York)
Dipl.-Ing. Matthias Zink, CEO Automotive, Schaeffler AG, Bühl

Plenary speeches (Room New York)
08:45 What moves us and what drives us - Future mobility and powertrain
Dipl.-Ing. Matthias Zink, CEO Automotive, Schaeffler AG, Bühl
09:15 Combustion engine and electromobility - Competitive struggle or synergy?
Prof. Dr.-Ing. Stefan Pischinger, Head of Institute, Co-authors: Christoph Lentz, both VWA, 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 exhibition
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
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
Dr.-Ing. Heribert Reiter, Vice President Engineering Tractors Global, Managing Director, AGCO GmbH, Marktberdorff, Germany
12:00 Lunch and visit to the exhibition

5th International VDI Congress „Transmissions in mobile machines“ (Room Bangkok)
13:10 Welcome by the congress chairman
Prof. Dr. Ludger Frerichs, Head of Institute for mobile machines and commercial vehicles, TU Braunschweig, Germany

Future drive systems
Moderation: Prof. Dr. Ludger Frerichs
13:15 The drive system of the future is electric (Winner of the German Environmental Award 2017)
- Type overview and engine structure
- Variety and optimization criteria for electric engines
- Comparison: Pros and cons of different technologies
- Application areas, electric engines as main propulsion system
- Predicted drive technology - what will it look like in future?
Dipl.-Ing. (FH) Johannes Oswald, Managing Director, Oswald Elektromotoren GmbH, Miltenberg, Germany
13:45 Electric drives in mobile machinery: current trends and main drivers
- Consequential requirements and thoughts on implementation
- Why (diesel-) electric drive systems? A new driving force: „Zero Emission“
- Fundamental factors influencing electric engine layout
- Aggregation of various application fields in line with the properties of their electric drive
- How requirements towards electric engines are derived demonstrated by the example of high-speed traction engines
Dipl.-Ing. Martin Paal (B.A.), Senior Application Engineer drive-system technology, Co-author: Dipl.-Ing. Klaus Graner, both Liebherr-Components Biberach GmbH, Biberach a. d. Riss, Germany
14:15 Caterpillar – making progress possible
- Perspective on megatrends
- Key technologies
- Powertrain portfolio building blocks
- A view into the future for technology development
Markus Gebauer, Europe Region Manager, Co-author: Evan Jacobson, Engineering Manager, both Caterpillar Inc., Geneva, Switzerland
14:45 Off-Highway battery electric vehicles
- State of electrification
- Impact on vehicle design
- Key future problems
- Change timing
Edward L. Wagner, Chief Director, Guangxi Liugong Machinery Co. Ltd., China
15:15 Realisation of marketable electric drive concepts for tractor units
- Electrification in agricultural engineering
- Hybrid and electric tractor
- Alternative drivelines for tractors
Thomas Woopen M.Sc., Engineer for Development, Tractor Engineering Germany, Co-authors: Dipl.-Wirt.-Ing. Armin Gronewold, Dr. Ing. Stephan Hammes, all AVL GmbH, Neuss, Germany
15:45 Coffee break and visit to the exhibition
16:00 World Cup Special: FIFA Football Russia
South-Corea – Germany
Mexico – Sweden

Drive-systems for tractors (Room Bangkok)
Moderation: Dr.-Ing. Hagen Adam, AVL Commercial Driveline & Tractor Engineering GmbH, Neuss / Steyr (A)
18:00 Overview of modern transmission concepts in tractors
- Global technology stages
- Partial and full-load manual transmission: basic structures, properties, selected examples
- Power split continuously variable transmissions: basic structures, properties, selected examples
- Future lines of development
Dipl.-Ing. Agr. (FH), Dipl.-Wirts.-Ing. FH Roger Stimmann, Executive Master of Business Administration, Lecturer in agritechnical engineering, University of Applied Sciences Bern, Zollikofen, Switzerland
18:30 Development of a CVT transaxle with differential steering for caterpillar tractors of around 300 kW
- Potential of continuously variable transmissions in caterpillar tractors
- Requirements of a caterpillar tractor posed towards the continuously variable powertrain
- Assembly of a tractor rear axle with hydrostatic differential steering system
Dipl.-Ing. (FH) Eduard Schnur, Engineer for Development Powertrain / Transmissions, Co-authors: Dipl.-Ing. Univ. Sven Krieger, Dr.-Ing. Martin Brenninger, all AGCO GmbH, Marktberdorff, Germany

www.vdi-wissensforum.de/getriebe-arbeitsmaschinen
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 old 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, 28 June, 2018

Methods of driveline development
Moderation: Dipl.-Ing. Gunnar Stein, Oerlikon Drive Systems GmbH, Pfaffikon (CH)
08:30 Automated gear composition and assessment of electric power split continuously variable transmissions
• Automated gear composition and assessment
• Electric power split transmissions
• Looking for transmission concepts
Dipl.-Ing. Benedikt Reick, Engineer Predevelopment, Co-authors: Dr.-Ing. Karl Grad, Dipl.-Ing. Michael Wechs, all ZF Friedrichshafen AG, Friedrichshafen/Passau, Prof. Dr.-Ing. Marcus Geimer, Karlsruher Institute for Technology (KIT), Karlsruhe, Germany

09:00 Efficient development by means of automated calibration of tractor control units
• Transmission tuning
• Power split transmission technology
• Optimization algorithms
• Vehicle testing
Dipl.-Ing. Christopher Körting, Area Development Off-Highway, Co-authors: Univ.-Prof. Dr.-Ing. Georg Jacobs, both MSE - Institute for Machinery-Elements and Systemdevelopment, RWTH Aachen University, Germany, Gabriele Morandi, CNH Industrial, Italia

09:30 All-embracing method to determine suitable driveline technologies and architectures
• Development methods
• Driveline technology
• Driveline architecture
Hagen Neurath M.Sc., Scientific Assistant, Co-author: Prof. Dr. Ludger Frerichs, both Institute for mobile machines and commercial vehicles, TU Braunschweig, Germany

10:00 Potentials of mechanical LVG for small mobile machinery
• Synthesis method for power split transmissions
• Fields of applications and performance limits of power split transmissions with mechanical variators
• Introduction of a mechanical power split transmission prototype
• Efficiency assessment
Christian Pelger M.Sc., Group Leader Components and drives for Off-Highway Technology, Co-authors: Univ.-Prof. Dr.-Ing. Georg Jacobs, both Institute of Machine Elements and System Development, RWTH Aachen University, Prof. Dr.-Ing. Heinz-Dieter Schneider, GfF-Entwicklungsgesellschaft mbH, Aachen, Germany

10:30 Coffee break and visit to the exhibition

Drive-system concepts
Moderation: Dipl.-Ing. (FH) Tilo Huber, ZF Friedrichshafen AG, Passau
11:15 Flexible double clutch transmission concept for articulated dump trucks
• Development of a compact 12 gear DKG concept for construction machinery
• Adapted core synchronization unit for the use of claw
• Drafting a system to achieve very good start up and shift performance in severe operating conditions for dump trucks
• Development potentials of the new concept for future powertrains
Dipl.-Ing. Rico Resch, Engineer Development, Co-author: Dr.-Ing. Jörg Müller, Erik Schreiterer, all IAV GmbH, Stollberg, Germany

11:45 Validation of new functionality to a mechanical powertrain for mobile machinery with individually controlled wheels
• Torque vectoring
• Hardware in the loop
• Torque splitter
• Mechatronic functions
Dipl.-Ing. Danilo Engelmann, Professor for Thermodynamic and combustion engines, Emission testing center and motor lab, Co-author: Stefan Herr, both University of Applied Sciences Bern, Nidau, Switzerland
Module-based axle transmission concept for electric commercial vehicles

- Necessity of high axle-gear ratios in E-engines
- Module-based concept using as many serial components as possible
- Parts commonality concept with solution for the combustion engine

Dr.-Ing. Christo Braykoff, Head of transmissions gear calculation, Co-authors: Dipl.-Ing. Bernd Zornek, Dr.-Ing. Klaus Johann Moser, Dr.-Ing. Christian Wirth, all MAN Truck & Bus AG, Munich, Germany

Drives in digitized systems

Moderation: Philipp Suhm M.Sc.
Liebherr - Components Biberach GmbH, Biberach a.d. Riss (G)

Getting more out of existing sensors

- Control algorithms to measure: true torque, backlash and tooth position to achieve higher shifting comfort and safe of dog clutch engagement
- Sophisticated controls, true torque measurement and of backlash in transmission
- Improved shifting comfort, safe engagement of dog clutches
- Using existing sensors

Ian Morrish, Co-authors: Richard Taylor, Gunnar Stein, all Vocis Oerlikon Drive Systems, Pfäffikon, Switzerland

Requirements posed by „autonomous driving“ in agricultural and construction machinery towards the powertrain

- The powertrain can be controlled electronically from engine via transmission to the axles: drive-by-wire, steer-by-wire, brake-by-wire
- Requirements towards x-by-wire systems for autonomous driving and autonomous working (SIL-classification, legal provisions...)
- Additional sensor technology to monitor the condition of the powertrain (Condition Monitoring)

Dipl.-Ing. (Univ.) Stefan Prebeck, Head of Development agricultural machines, Co-author: Dr.-Ing. Mark Mohr, both ZF Friedrichshafen AG, Passau, Germany

Global vs. regional transmission and drive development in the Off-Highway industry

Experts:

Dr.-Ing. Hagen Adam
Managing Director and Business Field manager Off Road, AVL Commercial Driveline & Tractor Engineering GmbH, Neuss / Steyr, Germany / Austria

Dipl.-Ing. Joachim Bereth
Manager Drivetrain Global Mid Tractor, John Deere Company, Mannheim, Germany

Dipl.-Ing. (Univ.) Stefan Prebeck
Head of Development agricultural machines, ZF Friedrichshafen AG, Passau, Germany

Dipl.-Ing. Gunnar Stein
CTO, Oerlikon Drive Systems GmbH, Pfäffikon, Switzerland

Moderation:

Prof. Dr. Ludger Frerichs
Head of Institute for mobile machines and commercial vehicles, TU Braunschweig, Germany

Anne Bieler-Bultmann M.A.
Projectleader, VDI Wissensforum GmbH, Düsseldorf, Germany

Summary by the congress chairman and end of the event
Sponsoring and Exhibition

Dritev, the international congress of drivetrain experts, is one of the world’s best specialist congress for transmission engineering. Illustrating the whole supply chain for drivetrains in mobile applications the exhibition becomes a cross-industry information platform for requirements on transmission and powertrain.

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 the conference participants, please contact:

Your contact person:
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Gold-Sponsorship

Professional support

VDI Society MEG

The technical division agricultural engineering is a traditional meeting point and an entry point for the agricultural engineering industry. Professionals with an industrial or scientific background or those from the administrative organisation or farming itself maintain close ties to this division. The voluntary work is done in study groups and expert committees. Cooperations exist: The technical division cooperates with the Deutsche Landwirtschafts-Gesellschaft e.V. (German Agricultural Association), the Kuratorium für Technik und Bauwesen in der Landwirtschaft e.V. (Association for Technology and Structures in Agriculture) and the Verband Deutscher Maschinen- und Anlagenbau e.V., a German engineering association. Various activities of a scientific-technical nature are developed in the following areas of agricultural engineering: agricultural technology and agricultural process engineering, agricultural civil engineering, labour sciences in farming and cultivation, horticultural engineering, landscape ecology, renewable energy sources and biomass, environmental engineering and associated fields like municipal and household technology. The technical division Max-Eyth-Gesellschaft Agrartechnik (VDI-MEG) is traditionally based on Max Eyth (1836 - 1906) the „Father of modern Agricultural Engineering“. Since April 2009 agricultural engineering has been an independent division in the VDI-society Technologies of Life Sciences.

www.vdi.de/tls

VDI Society GPP

With its technical divisions the VDI-GPP is geared to provide scientifically sound knowledge to all industries to help them design and optimize products and processes with respect to quality, time and cost-benefit ratio. The knowledge derived from scientifically verified evidence embraces the entire product lifecycle from the original product idea and going from there to the subsequent stages product development, marketing and service and finally the recycling process. This is achieved by the use of optimized methods, tools and systems and also includes the necessary information technology. The VDI-GPP - being the most significant expert community within the VDI - offers a platform for technical debate and cooperation based on state-of-the-art technology and continuous enhancement and likewise helps detect and unveil new development trends. Find more information at www.vdi.de/gpp

Testimonials

Excellent overview on the current state-of-the-art in Off-Highway drive technology!
Martin von Hoyningen-Huene, John Deere Company

A highly interesting, worthwhile event!
Rainer Hommel, AVL CO X TE, Steyr
5th International VDI Congress
Transmissions in mobile machines 2018

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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

Information
The price includes the compendium, coffee breaks, beverages during breaks, lunches and the evening reception (congress).

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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