INTERNATIONAL POWERTRAINS, FUELS & LUBRICANTS MEETING
Event Guide
17-19 September 2018

DOWNLOAD THE APP

PFL18.ORG
EMERGENCY PROCEDURES

During the event, attendees should follow the emergency guidelines. Based on the location of the incident, report emergencies to the nearest venue or SAE International representative or report to the registration desk. Should a catastrophic event occur, attendees should follow the safety and security instructions issued by the facility at the time of the event. This includes listening for instructions provided through the public address system and following posted evacuation routes if required.

OPEN EXCHANGE OF IDEAS

The purpose of this meeting is to provide an open exchange of ideas. Remarks made by participants or members of the audience cannot be quoted or attributed to the individual or their company unless the individual or company expresses permission. Any record of remarks and discussions may not be used unless the individual and their company expresses permission.

CONSENT TO USE OF IMAGES

Please note that photographs and videos of event activities and attendees, taken by or on behalf of SAE International, shall be property of SAE International. By registering for an SAE International event, you consent to the use of any photograph or video in which you appear, without notice or compensation to you.
**PRACTICAL INFORMATION**

**EXHIBITION HOURS**

<table>
<thead>
<tr>
<th>Date</th>
<th>Monday, 17 September</th>
<th>Tuesday, 18 September</th>
<th>Wednesday, 19 September</th>
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<tbody>
<tr>
<td>Time</td>
<td>10:00 – 19:30</td>
<td>09:30 – 18:00</td>
<td>09:30 – 19:00</td>
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**REGISTRATION HOURS**

<table>
<thead>
<tr>
<th>Date</th>
<th>Sunday, 16 September</th>
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<th>Tuesday, 18 September</th>
<th>Wednesday, 19 September</th>
<th>Thursday, 20 September</th>
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<tbody>
<tr>
<td>Time</td>
<td>14:00 – 20:00</td>
<td>07:30 – 19:30</td>
<td>07:30 – 17:30</td>
<td>08:00 – 17:00</td>
<td>08:00 – 11:00</td>
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</tbody>
</table>

**NETWORKING EVENTS**

The IPF&L Meeting has plenty to offer - from social events to educational sessions, plenary speakers and a bustling exhibition area. What else does it offer?

Networking opportunities - the perfect way to unwind with your colleagues and friends, meet other professionals and reflect on your time in Heidelberg.

**WELCOME RECEPTION**

**Monday, 17 September | 18:30 – 19:30**

Location: Exhibition Area, Meriansaal (Ground Floor)

The Welcome Reception provides an excellent opportunity to network, meet old friends and colleagues, as well as meet new people as the event begins.

Light appetizers and drinks will be served in comfortable exhibition facilities, making this reception a must-attend event.

**GALA DINNER**

**Tuesday, 18 September | 19:00 – 21:30**

Location: King’s Hall, Heidelberg Palace

Take part in an exceptional dinner and evening at one of the city’s landmarks, the Heidelberg Palace, which majestically rises over the roofs of the old town.

You will be able to enjoy a selection of traditional food, regional wines and non-alcoholic beverages, whilst offering the opportunity to meet and engage with other participants.

Transfer to the Heidelberg Palace will be organized from the venue every 10 minutes as of 18:30. Access will be made based on the attendee badge.

**NETWORKING RECEPTION**

**Wednesday, 19 September | 18:00 – 19:00**

Location: Meriansaal, Foyer, Outdoors (Ground Floor)

The meeting closes with an Expert Panel Discussion followed by a celebration and reception sponsored by Aramco Research & Innovation. Take one last look around the exhibition area and network with your colleagues during this social function. All delegates are invited to attend this not to be missed event, following the fascinating panel discussions where nibbles will be provided to round off a great conference - it will be a fitting end to a wonderful week of science.

**Sponsored by**

All above functions are open to all conference attendees but as spaces are limited and will be managed on a first-come first-served basis, we invite you to pre-register. Accompanying guests can gain access to the Gala Dinner only by purchasing a ticket.

**ORGANISING COMMITTEE**

Dr. Max Magar, Co-Chair, MOT GmbH
Professor Ulrich Spicher, Co-Chair, MOT GmbH
Dr. Michael Bargende, University Stuttgart
Prof. Dr. Christian Beidl, University Darmstadt
Prof. Dr. Michael Günthner, University Kaiserslautern
Dr. Marcus Gohl, APL GmbH
Prof. Dr. Kurt Kirsten, APL GmbH
Dr. Hans-Pete Kollmeier, Fraunhofer Gesellschaft-NAS
Prof. Amin Velji, KIT Karlsruhe

**VENUE FLOORPLAN**

**SECOND FLOOR**

**FIRST FLOOR**

**GROUND FLOOR**
# Programme-at-a-Glance

## Sunday, 16 September
- **14:00 – 20:00**
  - Registration
  - Foyer

## Monday, 17 September
- **08:30 – 10:00**
  - Keynote Presentation
  - Christian Schwarz, Head of Department Predevelopment Gasoline Engines, BMW
  - Grosser Saal (Ground Floor)
- **10:00 – 10:30**
  - Networking Break
  - Meriansaal (Ground Floor)
- **10:30 – 12:30**
  - Technical Sessions
- **12:30 – 13:30**
  - Networking Lunch
  - Meriansaal (Ground Floor)
- **13:30 – 15:30**
  - Technical Sessions
- **15:30 – 16:00**
  - Networking Break
  - Meriansaal (Ground Floor)
- **16:00 – 18:30**
  - Technical Sessions
- **18:30 – 19:30**
  - Welcome Reception
  - Meriansaal (Ground Floor)

## Tuesday, 18 September
- **08:30 – 09:30**
  - Keynote Presentation
  - Staffen Lungren, Senior Specialist and Technology Advisor, Volvo Trucks
  - Grosser Saal (Ground Floor)
- **09:30 – 10:00**
  - Networking Break
  - Meriansaal (Ground Floor)
- **10:00 – 12:30**
  - Technical Sessions
- **12:30 – 13:30**
  - Networking Lunch
  - Meriansaal (Ground Floor)
- **13:30 – 15:30**
  - Technical Sessions
- **15:30 – 16:00**
  - Networking Break
  - Meriansaal (Ground Floor)
- **16:00 – 17:30**
  - Technical Sessions
- **18:00 – 19:00**
  - Networking Reception
  - Meriansaal, Foyer, Outdoors (Ground Floor)

## Wednesday, 19 September
- **08:30 – 09:30**
  - Keynote Presentation
  - Dr. Markus Scherer, Director Global Marketing and Product Development – Base Stocks and Metalworking Fluids, BASF SE
  - Grosser Saal (Ground Floor)
- **09:30 – 10:00**
  - Networking Break
  - Meriansaal (Ground Floor)
- **10:00 – 12:30**
  - Technical Sessions
- **12:30 – 13:30**
  - Networking Lunch
  - Meriansaal (Ground Floor)
- **13:30 – 15:30**
  - Technical Sessions
- **15:30 – 16:00**
  - Networking Break
  - Meriansaal (Ground Floor)
- **16:00 – 18:00**
  - Expert Panel Discussion
  - The Future of Combustion Engines
  - Sponsored by Grosser Saal (Ground Floor)
- **18:00 – 21:00**
  - Gala Dinner*
  - Off-site location: King’s Hall, Heidelberg Palace

## Thursday, 20 September
- **08:30 – 17:30**
  - Workshop Gasoline Direct Injection Deposits Workshop*
  - Ballsaal (First Floor)
- **10:00 – 11:30**
  - APL Automobil-Prüftechnik Landau Plant Tour*
  - Off-site location
- **13:30 – 15:30**
  - Daimler Wörth Plant Tour*
  - Off-site location

*Additional fee applies for attending this function.
**KEYNOTE SPEAKERS**

**Dr. Christian Schwarz**
Head of Department Predevelopment Gasoline Engines
**BMW Group**
Monday, 17 September | 08:30 – 10:00

**Dr. Staffan Lundgren**
Senior Technology Advisor - Energy Efficiency & Physics
**Volvo Group**
Tuesday, 18 September | 08:30 – 09:30

**Dr. Markus Scherer**
Director, Global Marketing & Product Development - Base Stocks and Metalworking Fluids
**BASF SE**
Wednesday, 19 September | 08:30 – 09:30

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**EXPERT PANEL DISCUSSION**

**THE FUTURE OF COMBUSTION ENGINES**

**WEDNESDAY, SEPTEMBER 19 | 16:00 – 18:00**

**MODERATOR**

Uwe Dieter Grebe
Executive Vice President, Global Business Development, Sales & International Operations
**AVL LIST GmbH**

**PANELISTS**

**Amer A. Amer**
Chief Technologist
**Saudi Aramco**

**Rolf Brück**
Managing Director
**Continental Emitec GmbH**

**Stephen Ciatti**
Principal Engineer for Advanced Engines
**PACCAR Technical Center**

**Shuji Kimura**
Research Project Manager
**Nissan Motor Co., Ltd.**

**Kurt Kirsten**
Head of Advanced Engrg and Innovation
**APL Automobil-Pruftechnik Landau GmbH**
## GASOLINE DIRECT INJECTION DEPOSITS WORKSHOP
### 20 SEPTEMBER 2018

### SESSION 1
**FORMATION MECHANISMS AND DEPOSIT EFFECTS**

As an introduction this first session an overview of the development of direct injection gasoline engines and the concurrent development of deposit formation issues and then focuses on some of the latest research into deposit formation mechanisms.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 - 09:00</td>
<td>Fuel Requirements and Deposit - Related Matters for DISI Engines</td>
<td>Gautam Kalghatgi (ret.), Principal Professional, Saudi Aramco</td>
</tr>
<tr>
<td>09:00 - 09:30</td>
<td>Impact of Injector Fouling on Combustion Performance in Gasoline Direct Injection Engines</td>
<td>Roger Cracknell, Technology Expert, Shell</td>
</tr>
<tr>
<td>09:30 - 10:00</td>
<td>Mechanism and Model of the Formation of Carbonaceous Injector Deposits in Internal Combustion Engines</td>
<td>Radomir I. Slavchov, CTO, Cambridge University</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Time</th>
<th>COFFEE BREAK</th>
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<td>10:00 - 10:30</td>
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</table>

### SESSION 2
**DEPOSIT EFFECTS AND TEST METHOD DEVELOPMENT**

The second session of the morning presents some recent research developments into the effects that fuel degradation and deposits can have on DISI engine performance.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 - 11:00</td>
<td>Stochastic Preignition and Engine Deposits: Is there a Connection</td>
<td>Elana Chapman, Fuels/ Biofuels Engineer, General Motors</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Adverse Effects of Fuel Combustion/ Degradation</td>
<td>Ladislav Fuka, Division Manager, SGS Czech Republik</td>
</tr>
<tr>
<td>11:30 - 12:00</td>
<td>A Study of Particulate Emission Mechanism from Injector Tip Deposit of Direct-Injection Gasoline Engines</td>
<td>Yoshihiro Imaoka, Engineer, Nissan Motor Co Ltd</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Time</th>
<th>LUNCH</th>
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<td>12:00 - 13:00</td>
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</table>

### SESSION 3
**DEPOSIT EFFECTS AND TEST METHOD DEVELOPMENT**

The first session of the afternoon looks at recent developments in test methods for generating DIGID and the effects that these deposits produce in engine performance.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 - 13:30</td>
<td>Fast Method of Generating Deposits in GDI Engines and Analysis of the Impacts on Emissions</td>
<td>Javier Ariztegui, Manager Discipline Mobility, Repsol Petroleo S A</td>
</tr>
<tr>
<td>13:30 - 14:00</td>
<td>Development of A Gasoline Direct Injection Injector Deposit Test for the Top Tier™ Detergent Gasoline Program</td>
<td>Dean Schoppe, Senior Project Engr, Intertek</td>
</tr>
<tr>
<td>14:00 - 14:30</td>
<td>Test Method to Monitor Injector Deposit Buildup</td>
<td>Michael Schulz, ISP Salzbergen GmbH &amp; Co. KG</td>
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<table>
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<td>14:30 - 15:00</td>
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### SESSION 4
**ANALYSIS AND DIAGNOSTIC TECHNIQUES**

The final session of the day highlights some of the sophisticated observational and analytical techniques that are being employed to understand the nature of DIGID and their formation mechanisms.

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<tr>
<th>Time</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>15:00 - 15:30</td>
<td>The Influence of Engine Test Conditions on Nozzle Tip Coking and Advanced Diagnostic Techniques for its Investigation</td>
<td>Gavin Dober, Senior Development Engineer, Delphi Diesel Systems</td>
</tr>
<tr>
<td>15:30 - 16:00</td>
<td>Understanding Fuel Additive Performance through the Use of Modern Chromatography and Mass Spectrometry</td>
<td>G. John Langley, Professor, University of Southampton</td>
</tr>
<tr>
<td>16:00 - 16:30</td>
<td>Impact of Injector Deposits on GDI Engine Performance and Emission</td>
<td>Hongming Xu, Professor, University of Birmingham</td>
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<tr>
<th>Time</th>
<th>RECEPTION</th>
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<td>16:30 - 17:30</td>
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AUTOMOBIL-PRÜFTECHNIK LANDAU (APL) PLANT TOUR

Thursday, 20 September 2018 | 10:00 – 11:30
Fee: 40 EUR + VAT

Buses will be leaving the venue 90 minutes prior to the tour starting time. Exact timings will be provided in due course. Please note that spaces are limited and provided on a first come, first-served basis.

The fee includes:
- Return bus transfer from the venue (Kongresshaus Stadthalle Heidelberg) to the APL facility
- Guided tour of the APL facility

Daimler Wörth Plant Tour

Thursday, 20 September 2018 | 13:30 – 15:30
Fee: 50 EUR + VAT

Buses will be leaving the venue 90 minutes prior to the tour starting time. Exact timings will be provided in due course. Please note that spaces are limited and provided on a first come, first-served basis.

The fee includes:
- Return bus transfer from the venue (Kongresshaus Stadthalle Heidelberg) to the Daimler facility
- Guided tour of the Daimler facility

During your visit to the plant the following rules should be considered:
Smoking, photographing, filming and the use of consumer electronics are not permitted in the plant. Minimum age of visitors is 16 years.

Contact the Registration Desk for further information or for joining the tours.
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<thead>
<tr>
<th>TIME</th>
<th>SESSION TITLE, DESCRIPTION, AND ROOM</th>
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<tr>
<td>08:30 - 10:00</td>
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<td>10:30</td>
<td>TECHNICAL AND BUSINESS SESSIONS</td>
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<td>12:00</td>
<td>TECHNICAL AND BUSINESS SESSIONS</td>
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**MONDAY, 17 SEPTEMBER**

**SESSION TITLE, DESCRIPTION, AND ROOM**

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<tr>
<th>TIME</th>
<th>Grosse Saal</th>
<th>Kaamermsuskaal</th>
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<th>Sebastun-Munteral Saal</th>
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<td>12:00</td>
<td>TECHNICAL AND BUSINESS SESSIONS</td>
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**MONDAY, 17 SEPTEMBER**

**SESSION TITLE, DESCRIPTION, AND ROOM**

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<tr>
<th>TIME</th>
<th>Trubeer Saal</th>
<th>Rob.Schummarl-Zimmer</th>
<th>Gustave-Mahlerl Zimmer</th>
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<tr>
<td>14:00</td>
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<tr>
<td>15:00</td>
<td>TECHNICAL AND BUSINESS SESSIONS</td>
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MONDAY, 17 SEPTEMBER

SESSION TITLE, DESCRIPTION, AND ROOM

TIME | MEETING ROOM
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08:00 | Session Chair: Sebastian Munster-Saal

SESSION DESCRIPTION

Gasoline Engine Lubricants (FFL344)

The main performance properties of engine oils also include preventing wear and improving lubrication of moving engine parts, ensuring good fuel efficiency, and not degrading over time. Techniques to test and substantiate technology to control these properties are constantly developing and tested. Some papers will present new and improved methods. This session will discuss the latest advances in these areas.

Homogeneous Charge Compression Ignition (HCCI) (FFL320)

Classical HCCI combustion with temperature control combining combustion onset and only a limited compression ratio drop is being replaced by the extended concept in which the fuel is introduced as a spray, laminar flow, combustion, and compression ratio are controlled by intrusion. This session is based on applications, combustion effects, combustion control, and model validation. The papers will present new and improved methods. This session will cover the latest advances in these areas.

Catalyst Durability and Friction Reduction with Ultra-Low Inflow C2D2 (2018-01-1451)

2018-01-1742

GASOLINE ENGINES - ENGINE COOLING

Session Chair: Sebastian Munster-Saal

Investigation of the Injection Strategy for PCCI Combustion Control Using the Ultrahigh Injection Pressure Technique

Muhammad Umer Waqas, Abdulrahman Mohammed, Jean-Baptiste Masurier, Bengt Johansson, King Abdullah University of Science & Tech.

Investigation of the Injection Strategy for PCCI Combustion Control Using the Ultrahigh Injection Pressure Technique

Muhammad Umer Waqas, Abdulrahman Mohammed, Jean-Baptiste Masurier, Bengt Johansson, King Abdullah University of Science & Tech.

Combustion, Performance, and Emission Characteristics of Diesel/Cotton Seed Oil Blends

Mohan, King Abdullah University of Science & Tech.; Xing-Cai Lu, Shanghai Jiao Tong University; Taguchi, Kenta Egoshi, Hiroshi Kawanabe, Kenji Enya, Hiroki Watanabe, Noboru Mohd Fareez Edzuan Bin Abdullah, Johann Hauber, Karl Huber, Technische Universität München; Felix Leach, University of Oxford

Effects of Bio-Alcohol Fuel Blends on the King of Engine Oil Consumption and Oil Change Intervals

Dimitrios Karonis, Iraklis Zahos Siagos, National Technical University of Athens; Fanourios Zannikos, National Technical University of Athens; Shyamsing Vijaysing Thakur, D Y Patil COE

Effect of High Compression Ratio on the Emission Characteristics of a Diesel Engine

Dimitrios Karonis, Iraklis Zahos Siagos, National Technical University of Athens; Fanourios Zannikos, National Technical University of Athens; Shyamsing Vijaysing Thakur, D Y Patil COE

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Effect of High Compression Ratio on the Emission Characteristics of a Diesel Engine

Dimitrios Karonis, Iraklis Zahos Siagos, National Technical University of Athens; Fanourios Zannikos, Natio
## SESSION TITLE, DESCRIPTION, AND ROOM

### 10:00 AM - 12:30 PM

**Session: Powertrain Fuels and Lubricants Activity**

**Chairpersons:**
- Staffan H. Lundgren, Volvo Group
- Michael Clifford Kocsis, Southwest Research Institute

**Keynote:**
- Keynote: Staffan Lundgren, Volvo Group

**Papers with an emphasis on lubricating fluids with driveline hardware**

**Abstracts:**
- High-speed internal combustion engines: fundamentals, related combustion, and optimization
- Understanding of processes related to turbulent transport, system level simulation, optimization, variations, degradation, and control

**Schedule:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
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</thead>
<tbody>
<tr>
<td>10:00 - 10:15</td>
<td>Robert A. Schiessl, Jörg Sommerer, ITT/KIT</td>
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<tr>
<td>10:15 - 10:30</td>
<td>Fabian Titus, MOT GmbH; Peter Berlet, University of Kharkiv; Evgeny Zenkin, University of Kharkiv; Volodymyr Savchuk, Kherson National University; Victor Zaharchuk, Lutsk National University; Andrii Golovan, Odessa National Maritime University; Victor Boyko, Natalia Shybaieva, Technology Solutions Inc.; Nickolay Stojanov, The Lubrizol Corporation; Elizabeth Schiferl, Adam Stackpole, Robert Newcomb, Christopher Saxton, Lubrizol Corp.</td>
</tr>
<tr>
<td>10:30 - 10:45</td>
<td>Qing Du, Tianjin University; Jun Zhang, Tsinghua University; Jinzhu Qi, Yantai University; Hua Zhao, Chiba University; Hisakazu Suzuki, National Traffic Safety Research Institute; Sangmyeong Kim, Tatsuya Kuboyama, Yasuo Moriyoshi, University of Tokyo; Akio Kobayashi, Aichi Institute of Technology; Hidenori Matsuoka, Toyota Central R&amp;D Laboratories; Theodoros Zannis, Hellenic Naval Academy</td>
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<tr>
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<td>Development of Model Predictive Control Strategy of SCR System for Heavy-Duty Diesel Engines with a One-State Model (2018-01-1774)</td>
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<tr>
<td>10:45 - 11:00</td>
<td>Ryo Masuda, Takayuki Fuyuto, Toyota Central R&amp;D Labs., Akio Kobayashi, Aichi Institute of Technology; Chaitanya D. Ghodke, Convergent Science Inc.; Max Kiefer, AVL Fuel Cell Engineering Solutions; Thomas McKinley, Cummins Inc.; Andrea Zamboni, ILF Consulting AG; Jian Gong, Thomas McKinley, Cummins Inc.; Andrea Zamboni, ILF Consulting AG; Patrick Strzelec, Mississippi State Univ.</td>
</tr>
<tr>
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<td>Structural Integrity of Infrared Motors (2018-01-1629)</td>
</tr>
<tr>
<td>11:00 - 11:15</td>
<td>Jiawei Lai, Owen Parry, Sebastian Van Zijverden, University of Massachusetts at Amherst; Carol St John, John Pobjoy, Farzaneh Moradi, Juergen Rechberger, AVL LIST GmbH</td>
</tr>
<tr>
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<td>A Numerical Investigation on Effects of CO Combustion in a Diesel Engine Using the 0D Modeling of Real-Driving NOx Emissions for a Diesel Engine (2018-01-1786)</td>
</tr>
<tr>
<td>11:15 - 11:30</td>
<td>Emilia; Carlo Pirola, Università di Milano; Richard Benvolt, David Ades, Steve Brinn, Afton Chemical Corp.</td>
</tr>
<tr>
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<td>Application of Genetic Algorithms for the Calibration of a Diesel Oxidation Catalyst Model (2018-01-1718)</td>
</tr>
<tr>
<td>11:30 - 11:45</td>
<td>Thelwall, The Lubrizol Corporation; Patrick Strzelec, Mississippi State Univ.; Theodoros Zannis, Hellenic Naval Academy; Jose V. Pastor, Michael Clifford Kocsis, Southwest Research Institute; James Clifford, Afton Chemical Corp.; Stefan Hunt, Lubrizol Limited; Christopher S. Newcomb, Lubrizol Corp.</td>
</tr>
<tr>
<td></td>
<td>Effect of Cylindrical Penetration on the Dispersion of Diesel Spray Nozzles in a Diesel Engine Using the 0D Modeling of Real-Driving NOx Emissions for a Diesel Engine (2018-01-1775)</td>
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<td>11:45 - 12:00</td>
<td>Xiao Li, Bang-Quan He, Tianjin University; Hua Zhao, Chiba University; Hisakazu Suzuki, National Traffic Safety Research Institute; Sangmyeong Kim, Tatsuya Kuboyama, Yasuo Moriyoshi, University of Tokyo; Akio Kobayashi, Aichi Institute of Technology; Hidenori Matsuoka, Toyota Central R&amp;D Laboratories; Theodoros Zannis, Hellenic Naval Academy</td>
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<td>Development of NOx Reduction Strategies for Diesel Engines Using the 0D Modeling of Real-Driving NOx Emissions for a Diesel Engine (2018-01-1759)</td>
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<td>12:00 - 12:15</td>
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<td>Tetsuo Hirai, Delphi Delphi, Honda Roppongi, Honda Roppongi; Emilia; Carlo Pirola, Università di Milano; Richard Benvolt, David Ades, Steve Brinn, Afton Chemical Corp.</td>
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<td>Calibration of the Oxidation Catalyst Model Based on Test Data from a Diesel Engine Using the 0D Modeling of Real-Driving NOx Emissions for a Diesel Engine (2018-01-1776)</td>
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</table>

**Fuels and Lubricants Activity**

**Chairpersons:**
- Staffan H. Lundgren, Volvo Group
- Michael Clifford Kocsis, Southwest Research Institute

**Papers with an emphasis on exhaust aftertreatment system models, as specialized for control, control and optimization techniques. Topics encompassed include DOC, HC Trap, DPF, GPF, LNT, NOx aftertreatment systems, optimization, related combustion, and optimization**

**Abstracts:**
- Understanding of processes related to turbulent transport, system level simulation, optimization, variations, degradation, and control
- High-speed internal combustion engines: fundamentals, related combustion, and optimization

**Schedule:**

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<tr>
<td>10:00 - 10:15</td>
<td>Robert A. Schiessl, Jörg Sommerer, ITT/KIT</td>
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<tr>
<td>10:15 - 10:30</td>
<td>Fabian Titus, MOT GmbH; Peter Berlet, University of Kharkiv; Evgeny Zenkin, University of Kharkiv; Volodymyr Savchuk, Kherson National University; Victor Zaharchuk, Lutsk National University; Andrii Golovan, Odessa National Maritime University; Victor Boyko, Natalia Shybaieva, Technology Solutions Inc.; Nickolay Stojanov, The Lubrizol Corporation; Elizabeth Schiferl, Adam Stackpole, Robert Newcomb, Christopher Saxton, Lubrizol Corp.</td>
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<td>Development of Model Predictive Control Strategy of SCR System for Heavy-Duty Diesel Engines with a One-State Model (2018-01-1774)</td>
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<td>Ryo Masuda, Takayuki Fuyuto, Toyota Central R&amp;D Labs., Akio Kobayashi, Aichi Institute of Technology; Chaitanya D. Ghodke, Convergent Science Inc.; Max Kiefer, AVL Fuel Cell Engineering Solutions; Thomas McKinley, Cummins Inc.; Andrea Zamboni, ILF Consulting AG; Patrick Strzelec, Mississippi State Univ.</td>
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<td>Structural Integrity of Infrared Motors (2018-01-1629)</td>
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<td>Jiawei Lai, Owen Parry, Sebastian Van Zijverden, University of Massachusetts at Amherst; Carol St John, John Pobjoy, Farzaneh Moradi, Juergen Rechberger, AVL LIST GmbH</td>
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<td>A Numerical Investigation on Effects of CO Combustion in a Diesel Engine Using the 0D Modeling of Real-Driving NOx Emissions for a Diesel Engine (2018-01-1786)</td>
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<td>Emilia; Carlo Pirola, Università di Milano; Richard Benvolt, David Ades, Steve Brinn, Afton Chemical Corp.</td>
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<td>Application of Genetic Algorithms for the Calibration of a Diesel Oxidation Catalyst Model (2018-01-1718)</td>
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<td>Thelwall, The Lubrizol Corporation; Patrick Strzelec, Mississippi State Univ.; Theodoros Zannis, Hellenic Naval Academy; Jose V. Pastor, Michael Clifford Kocsis, Southwest Research Institute; James Clifford, Afton Chemical Corp.; Stefan Hunt, Lubrizol Limited; Christopher S. Newcomb, Lubrizol Corp.</td>
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<td>Grosser Saal</td>
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<tr>
<td>08:30 - 09:30</td>
<td>Embedded Control Systems</td>
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**Grosser Saal**

**Grosser Saal**

09:30 - 10:30 | Diagnostic Development (FFL164) | Organizers: Markus Scherer, BASF SE | Organizers: Markus Scherer, BASF SE | Organizers: Markus Scherer, BASF SE |

This session focuses on engine combustion performance and emissions monitoring. Presentations include state-of-the-art techniques for real-time diagnosis and predictive maintenance, highlighting advances in sensors, data processing, and machine learning applications.

10:30 - 11:30 | Software-Reliability Growth Modeling: A Review | Organizers: M. Ilyas Malik, Mohammad Jaare, ASV, Audi, Phenix, M. Qayyum, Mohammad Jaare, ASV, Audi, Phenix, M. Qayyum, Mohammad Jaare, ASV, Audi, Phenix |

This session explores the latest developments in software reliability growth modeling, examining methodologies, case studies, and practical applications in automotive software development.

11:30 - 12:30 | Effect of Mixture Formation and Ignition on NOx Emissions in Turbocharged Engines | Organizers: Michael M. Even, Renault E.T.R., Munich, Germany; Michael M. Even, Renault E.T.R., Munich, Germany; Michael M. Even, Renault E.T.R., Munich, Germany |

This session delves into the intricate relationship between mixture formation, ignition characteristics, and NOx emissions in modern turbocharged engines, offering insights into advanced spark ignition systems and new fuel injection strategies.

**Kammermusiksaal**

09:30 - 10:30 | Effects of Injection Rate Profiles on Auto-ignition Characteristics and Performance with Euro VI Diesel Engines | Organizers: Tarek M. Abdel-Salam, East Carolina University; Alessandro Montanaro, University of Kaiserslautern; Yanzhao An, Mohammed Jaasim Mubarak, Abdullah Al-Rumadani, University of Science and Technology, Qatar; N. K. Goyal, Indian Institute of Technology, Madras |

This session examines the impact of injection rate profiles on auto-ignition characteristics and engine performance, focusing on Euro VI diesel engines. Presentations will cover experimental and simulation results focused on applications, describing experiments and test data, and comparing real-world engine performance to simulations.

10:30 - 11:30 | Effects of Different Injection Strategies and Aftertreatment on Performance Characteristics and Spay in Diesel Engines | Organizers: Tarek M. Abdel-Salam, East Carolina University; Alessandro Montanaro, University of Kaiserslautern; Yanzhao An, Mohammed Jaasim Mubarak, Abdullah Al-Rumadani, University of Science and Technology, Qatar; N. K. Goyal, Indian Institute of Technology, Madras |

This session explores the effects of various injection strategies and aftertreatment systems on diesel engine performance characteristics and spay, providing insights into optimizing engine efficiency and emissions.

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This session continues the exploration of mixture formation and ignition effects on NOx emissions in turbocharged engines, delving deeper into the complexities of engine design and emissions control.

**Gustav Mahler-Zimmer**

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**Trubner Saal**

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**International Powertrains, Fuels & Lubricants Meeting**

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WEDNESDAY, 19 SEPTEMBER

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<td>Discussion: Light-Duty Automotive and Emission Control Testing (FFL250)</td>
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<td>10:15 - 10:30</td>
<td>Organizers: John Shutty, BorgWarner Automotive; Patrick Nix, Michigan State University; Chairpersons: Gustav-Mahler-Zimmer, Michigan State University</td>
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<td>10:45 - 10:55</td>
<td>Organizers: Guoming G. Zhu, Michigan State University; Chairpersons: John Shutty, BorgWarner Automotive; Patrick Nix, Michigan State University</td>
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<td>10:55 - 11:10</td>
<td>Session 1: Performance and Development of Fuel and Lubricant Systems (FFL250)</td>
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<td>11:10 - 11:25</td>
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<td>11:25 - 11:40</td>
<td>Session 2: Engine Components, Actuation and Sensors (FFL250)</td>
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<td>Session 3: Fluid Flow and Flow Measurements (FFL250)</td>
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<th>EXHIBITOR</th>
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<td>Emissions Analytics Ltd</td>
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<td>LaVision GmbH</td>
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<td>MS4 - Analysentechnik GmbH</td>
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<td>Cambustion</td>
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ARAMCO RESEARCH & INNOVATION
Scheveningseweg 62-66, The Hague 2517XX
The Netherlands
www.saudiaramco.com

Aramco Research & Innovation – the state-owned oil company of the Kingdom of Saudi Arabia – is a fully integrated, global petroleum enterprise and a world leader in exploration, production, refining, distribution, marketing and petrochemicals manufacturing.

It manages the world’s largest proven conventional crude oil and condensate reserves of 260.2 billion barrels and the world’s fourth-largest natural gas reserves of 288.4 trillion standard cubic feet. Saudi Aramco is also among the top producers of natural gas, maintaining the fourth-largest natural gas reserves in the world.

INNOSPEC
R&T Laboratories Oil Sites Road, Ellesmere Port,
Cheshire CH65 4EI
United Kingdom
www.innospecinc.com

Innospec is a global specialty chemicals company focused on bringing innovative new additive technologies to market combined with a fast and responsive service.

Our global team of approximately 1800 employees spans 23 countries, applying their extensive experience and market understanding to customers’ local needs. Integrating our global footprint with local service capability enables us to supply quality products that meet and anticipate changing market dynamics. Innospec Fuel Specialties is a leading developer and supplier of specialty additives for petroleum-based fuels, coal, and biofuels used in a diverse scope of applications. With a worldwide supply chain, outstanding market knowledge, and first-class service, we are a powerful resource for solving fuel related challenges, enhancing performance and ensuring environmental compliance.

APL - AUTOMOBIL-PRUFTECHNIK LANDAU GMBH
Am Hüsel 11, Landau in der Pfalz, 76829
Germany
www.apl-landau.de

For more than 25 years the APL-Group has provided competent and dependable engineering services to an international customer base of automotive, commercial vehicle and oil industries. More than 1400 highly skilled and motivated employees make use of state-of-the-art test equipment and facilities. This includes more than 240 engine, gearbox, drivetrain and chassis dyno test stands.

Coupled with innovative development tools, test methods as well as complete solutions for test stands and measurement equipment, we deliver the highest quality powertrain development and validation service to our customers.

EMISSIONS ANALYTICS
Kimball Smith, Brewery House, Twyford,
Winchester, SO21 1RG, United Kingdom
www.emissionsanalytics.com

Emissions Analytics is an independent commercial testing house focused exclusively and intensively on real world emissions and fuel economy measurements. Operating since 2011, Emissions Analytics has tested over 2,000 models across passenger car, commercial vehicle and off-road applications specializing using portable emissions measurement systems (PEMS). Our test operations are based out of Stuttgart (Germany), Oxford (UK), Seoul (South Korea) and Los Angeles (United States), but they are as by definition portable, enabling us to serve our clients globally. We are delighted to work with a wide range of emissions stakeholders, including governments, cities, regulators, manufacturers, technology suppliers, oil companies and research institutions.
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MS4-Analysentechnik supplies engine exhaust gas- and particulate instrumentation. Robust, fast and selective the IMR-MS gas analyzer targets volatile HC, N2, Nx and Sx components at a wide dynamic range in application i.e. alternative fuel, cat efficiency, cat poisoning, oil consumption, oil dilution. A Quantum Cascade Laser analyzer can be configured for special applications. Engine design and calibration purposes are served by ultrafast response gas NDIR/CLD/FID analyzers. The application sub 23nm aerosol measurement is covered by the particle size spectrometer. EU6/US1065 compliant partial flow dilution tunnel targets gravimetric filter weighing applications. PM- and PN-Sensor technology is available for test bench and RDE use.

VTT Ltd is one of Europe’s leading research, development and innovation organisations. We help our customers and society to grow and renew through applied research. The business sector and society in general benefit most from VTT when we solve challenges requiring world-class know-how together, and convert them into business opportunities. VTT’s Engine and Vehicle emission laboratory provides emission and energy consumption measurement services. Research facilities include light- and heavy-duty chassis dynamometers, several engine dynamometers, medium-speed marine engine and exhaust gas aftertreatment test bench.

For more than 20 years, F&L Asia Ltd. has remained the preferred media choice for industry giants. Unparalleled thought leadership, stringent content quality standards and uncompromising journalism—gathering facts directly from the frontline, including from its permanent bases at the heart of the strategic Asian region are some of F&L Asia’s core strengths and the reason why it retains an unchallenged "first with the latest" position. F&L Asia’s diverse portfolio of unique and powerful lead generation tools fulfills the needs of hundreds of fuels and lubes operators of all sizes, all disciplines, and from around the world. This empowers them to increase their brand awareness and establish, promote and nurture fluid industry connections globally.
SAE INTERNATIONAL EVENTS

2018

Intelligent and Connected Vehicles
August 14-15
Kunshan City, Jiangsu, China

Connect2Car™ Executive Leadership Forum
September 2-6
San Jose, CA

SAE New Energy Vehicle Forum
September 11-12
Shanghai, China

COMVEC™
September 11-13
Rosemont, IL

On-Board Diagnostics
September 12-13
Indianapolis, IN

North American International Powertrain Conference
September 12-14
Chicago, IL

Noise and Vibration Forum
September 13
Shanghai, China

International Powertrains, Fuels & Lubricants Meeting
September 17-19
Heidelberg, Germany

From ADAS to Automated Driving
October 9-11
Detroit, MI

Transmission and Driveline Technologies
October 9-10
Plymouth, MI

Co-Optimization of Fuels and Engines
October 9-10
Plymouth, MI

Thermal Management Systems Symposium
October 9-11
San Diego, CA

Brake Colloquium & Exhibition
October 14-17
Palm Desert, CA

Heavy Duty Diesel Emissions Control Conference
October 16-17
Gothenburg, Sweden

SAE/JSAE Small Engine Technology Conference
November 6-8
Dusseldorf, Germany

Aerospace Systems + Technology Conference
November 6-8
London, UK

Defense Maintenance and Logistics Exhibition
December 17-19
Tampa, FL

DoD Maintenance Symposium
December 17-20
Tampa, FL

2019

Connect2Car™ at CES
January 8
Las Vegas, NV

International Powertrains, Fuels & Lubricants Meeting
January 22-24
San Antonio, TX

Hybrid and Electric Vehicle Technologies
February 19-21
Anaheim, CA

On-Board Diagnostics
March 12-14
Stuttgart, Germany

SAE AeroTech Americas
March 26-28
Charleston, SC

Government/Industry Meeting
April 3-5
Washington, DC

High Efficiency IC Engine
April 7-8
Detroit, MI

WGX™: SAE World Congress Experience
April 9-11
Detroit, MI

Connect2Car™ at WCX
April 9-11
Detroit, MI

Noise and Vibration Conference & Exhibition
June 10-13
Grand Rapids, MI

International Conference on Icing of Aircraft, Engines, and Structures
June 17-21, 2019
Minneapolis, MN

JSAE/SAE International Powertrains, Fuels & Lubricants Meeting
August 25-29
Kyoto, Japan

COMVEC™
September 10-12
Indianapolis, IN

On-Board Diagnostics
September 17-19
Garden Grove, CA

North American International Powertrain Conference
September 18-20
Chicago, IL

Brake Colloquium & Exhibition
September 22-25
Orlando, FL

SAE AeroTech Europe
September 24-26
Bordeaux, France

Thermal Management Systems Symposium
October 15-17
Plymouth, MI

For an updated listing of events, dates and locations, please refer to sae.org/events/