## Contents

**Part I  Clutch System and Controls**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of Overbend Blind Riveting in Designing and Manufacturing of Multiple-Plates Torque Converter</td>
<td>3</td>
</tr>
<tr>
<td>Kunding Wang, Alfredo Jiminez Perez Mitre, Zhiru Shi and Ricardo Andrecioli</td>
<td></td>
</tr>
<tr>
<td>Analysis of the Influence of Clutch Pedal to Vehicle Comfort</td>
<td>15</td>
</tr>
<tr>
<td>Jiangchuan Li, Feng Deng, Shaojin Liu and Hao Hu</td>
<td></td>
</tr>
<tr>
<td>Modeling and Parametric Study on Drag Torque of Wet Clutch</td>
<td>21</td>
</tr>
<tr>
<td>Heyan Li, Qi Jing and Biao Ma</td>
<td></td>
</tr>
<tr>
<td>Modeling and Simulation of an Electric Clutch Actuator</td>
<td>31</td>
</tr>
<tr>
<td>Hanqi Yue, Bin Wang, Lijiao Yu, Bingzhao Gao and Hong Chen</td>
<td></td>
</tr>
<tr>
<td>Methods for Clutch Dimensioning</td>
<td>39</td>
</tr>
<tr>
<td>Albers Albert, Sascha Ott and Philipp Merkel</td>
<td></td>
</tr>
<tr>
<td>Drive Train Vibrations: Solving the Conflict Between Efficiency and Drivability</td>
<td>49</td>
</tr>
<tr>
<td>Ad Kooy and Jürgen Kroll</td>
<td></td>
</tr>
</tbody>
</table>
Part II  Gear Systems and Driveline

Definition of Slippage Parameters of Friction Clutches in Gearboxes with Fixed Shaft Axles ........................................ 65
F2012-C02-001
Mikhail Dmitriev and Valery Sharipov

The Influence of Torque and Speed Sensitive Differential Characteristics in a Front Wheel Drive Vehicle During On-Limit Manoeuvres .............................................. 79
F2012-C02-003
Anthony Tremlett, David Purdy, Nick Vaughan, Francis Assadian, Adrian Moore and Martin Halley

Design and Performance Prediction of a Tri-Mode Power-Split Transmission .......................................................... 93
F2012-C02-004
Donghao Zhang, Changle Xiang and Lijin Han

Transient EHL Gear Contact Simulation ........................................ 107
F2012-C02-006
Peter Fietkau, Axel Baumann and Bernd Bertsche

An Enhanced Finite Element Model for Determination of Load Capacity in Planetary Gear Trains ......................... 119
F2012-C02-008
Ignacio Gonzalez-Perez, Alfonso Fuentes and Kenichi Hayasaka

Gear Oil Viscosity Modifiers and Their Impact on Efficiency ...... 131
F2012-C02-009
William Barton, Elizabeth Schiferl, Mark Baker and Simon Chai

On the Behaviour of Asymmetric Cylindrical Gears in Gear Transmissions ........................................................... 143
F2012-C02-010
Alfonso Fuentes, Ignacio Gonzalez-Perez, Francisco T Sanchez-Marin and Kenichi Hayasaka

Efficiency Optimization of Transmissions ........................................ 151
F2012-C02-013
Kathrien Inderwisch, Rashad Mustafa and Ferit Küçükay
Contents

Research on Safety Performance for Parking Mechanism on a 7-Speed Dual Clutch Transmission ........................................... 163
F2012-C02-015
Lingling Fu, Zhiling Qiu, Yuxiang Chen, Dawei Luo, Yong Chen, Daguo Luo and Fuquan Zhao

Control Strategy and Function Design Based on Lever Analogy ....... 175
F2012-C02-019
Hua Tian and Peng Chen

Research on Precision Forging Tooth Billet of Driven Bevel Gear . . . 183
F2012-C02-021
Baoyang Song, Chenglin Xu, Chenglin Fu, Zhuang Fu, Guansheng Wang, Shibao Liu, Zhaodan Yuan, Xiaohui Li and Xinghua Li

Schaeffler Lightweight Differentials ........................................... 199
F2012-C02-022
Thorsten Biermann, Xiaogang Chang and Bernd Robert Höhn

Part III Advanced Transmission System

The Design Concept of Complete Traction Electric Equipment Sets for Hybrid Vehicles ......................................................... 217
F2012-C03-002
Stanislav Florentsev, Dmitry Izosimov and Ivan Ksenevich

The Design, Development and Industrialization of Shangri New Type of Automatic Transmission in China ..................... 229
F2012-C03-003
Jan Gang Lu and Xingwu Liu

The Double Roller Full Toroidal Variator: A Promising Solution for KERS Technology ....................................................... 241
F2012-C03-006
Giuseppe Carbone, Francesco Bottiglione, Leonardo De Novellis, Luigi Mangialardi and Giacomo Mantriota

CVT’s Evolution and Nissan’s Latest CVT Technologies .............. 251
F2012-C03-009
Yoshitaka Miura, Kiyonari Yamamoto and Tetsuro Ito
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of a New 6-Speed Dual Clutch Transmission for the China Market</td>
<td>261</td>
</tr>
<tr>
<td>Chao Jiang, Mingli Huang, Gold Eckart and Xiaoning Xiang</td>
<td></td>
</tr>
<tr>
<td>Development of New CVT for K-Car</td>
<td>271</td>
</tr>
<tr>
<td>Koichi Konishi</td>
<td></td>
</tr>
<tr>
<td>Research on Development Process of 7 Speed Wet Dual Clutch Transmission</td>
<td>275</td>
</tr>
<tr>
<td>Yong Chen, Mike Turner, Michael Gilcrist, Wenjiang Zhao, Daguo Luo and Fuquan Zhao</td>
<td></td>
</tr>
</tbody>
</table>
Modeling and Simulation of a New Type Hydraulic System on CVT ........................................ 349
Yanhui Lu, Mingshu Liu and Yang Liu

Research and Control of Shift Without the Disengagement of the Clutch for Automatic Mechanical Transmission in Hybrid Vehicle ........................................ 361
Shaohua Sun, Yulong Lei, Hongbo Liu, Yao Fu and Huabing Zeng

Analysis of Desert Adaptation on Shifting Strategy for Heavy Off-Road AMT Vehicle ........................................ 373
Yanghong Xue, Yuhui Hu and Huiyan Chen

Fuzzy Logic Controlled Electromagnetic Actuated CVT System for Passenger Car ........................................ 387
Rahman Ataur and Sharif Sazzad Bin

Modelling and Simulation of DCT Gearshifting for Real-Time and High-Fidelity Analysis ........................................ 399
Lionel Belmon, Jun Yan and Andreas Abel

Optimized AMT Systems from ZF: A Choice for Comfort and Fuel Consumption Improvement in the Small Car Segment ........................................ 413
Benedikt Schauder and Joerg Buhl

Shifting Control Strategy Research in the Hard Accelerating Condition Based on the AMT Vehicle ........................................ 423
Yang Gao, Yong Chen, Daguo Luo, Wenzhong Liu, Mingqi Gu and Fuquan Zhao

Robust Design Method for Automatic Calibration of Automatic Transmission Shift Control System ........................................ 433
Ryoichi Hibino, Tomohiro Miyabe, Masataka Osawa and Hideaki Otsubo
Clutch Transmissible Torque Estimation for Dry Dual Clutch Transmission Control ........................................ 449
F2012-C04-021
Kihoon Han and Yongsoon Yoon

AMT Control for Parallel Hybrid Electric Vehicles ............... 457
F2012-C04-022
Gianluca Zito

Part V Other

Numerical Sensitivity Analysis of the Effect of Pump Outlet Radius on the Performance of Torque Converter ............... 471
F2012-C05-001
Qingdong Yan, Cheng Liu, Wei Wei and Boshen Liu

Modelling of Oil Heating of Disengaged Lubricated Clutches in Hybrid Vehicles ........................................ 479
F2012-C05-002
Friedrich Brezger and Albert Albers

AWD Coupling Modeling and Contribution to Vehicle Dynamics ................................................................. 495
F2012-C05-005
Aris Maroonian, Tsutomu Tamura and Robert Fuchs
Proceedings of the FISITA 2012 World Automotive Congress
Volume 5: Advanced Transmission System and Driveline
; (Eds.)
2013, X, 506 p. 410 illus., 297 illus. in color., Hardcover
ISBN: 978-3-642-33743-7