

Table of Contents

Introduction

Safer Stopping and Going Via Electronics	v
Ronald K. Jurgen, Editor	

Antilock Braking Systems (ABS), Brake-by-Wire

Standardization and Cost Optimization of ABS ECUs (98C004)	3
Thomas Frank	
Furthering the Evolution of Function and Performance for ABS Systems (980236)	13
Masahiro Asano	
Smart Algorithm for a Tire Pneumatic Pressure Monitor Embedded in ABS Program (980237)	23
Katsuhiko Iwazaki and Isahiko Tanaka	
ABS Braking Performance and Steering Input (980240)	31
Alan Strickland and Ken Dagg	
Automatic Valuation and Verification of ABS Controllers by Using a Hardware-in-the-Loop Simulation (980241)	39
Ferdinand Svaricek	
Hardware-in-the-Loop Simulation for ABS (980244)	47
M. W. Suh, C. S. Seok, Y. J. Kim, J. H. Chung, S. M. Kim, J. C. Lee, and S. I. Lee	
New Low Cost ABS Concept for Small Cars (970811)	55
Hans-Jörg Feigel, Peter Rieth, Georg Roll, and Lothar Schiel	
Use of a Hazard and Operability Study for Evaluation of ABS Control Logic (970815)	65
Michael J. Schneider	
Development of Four Solenoid ABS (960958)	75
Takeshi Naito, Hiroaki Takeuchi, Hiromu Kuromitsu, and Kiyoshi Okamoto	
ABS5.3: The New and Compact ABS5 Unit for Passenger Cars (950757)	83
Martin Maier and Klaus Müller	
Intelligent Braking for Current and Future Vehicles (950762)	91
Donald E. Schenk, Richard L. Wells, and Jon E. Miller	

ABS Extending the Range (940829)	95
Thomas P. Mathues	
Acceleration Sensor for ABS (920477)	101
Hidetoshi Saito, Nobuyuki Sasaki, Tohru Nakaura, Masahiro Kume, Hirohisa Tanaka, and Masaki Nishikawa	
Electronic Brake Force Distribution Control—A Sophisticated Addition to ABS (920646)	109
Gunther Buschmann, Hans-Thomas Ebner, and Wieland Kuhn	
Compact ABS Modulator with Small-Solenoid Valves (920647)	117
Tomohiro Fujita, Katsuhiko Miyata, and Toshifumi Maehara	
The Use of a Graphical Modeling Environment for Real-Time Hardware-in-the-Loop Simulation of Automotive ABS Systems (930507)	125
Larry Michaels	
Synthesis of ABS Hydraulic Systems (930509)	129
Peter Hattwig	
Design Analysis of an Electronically-Controlled Hydraulic Braking Systems Using the Saber Simulator (940182)	141
Mike Donnelly, Craig Siegel, and Dale Witt	
Ice, ABS, and Temperature (940724)	147
Ross Eddie	
ABS and Relative Crash Risk under Different Roadway, Weather, and Other Conditions (950353)	153
Leonard Evans	
“ROADRUNNER”—Real-Time Simulation in Anti-Lock Brake System Development (950758)	163
Th. Bach, H. Schmitt, W. Schwanke, H.-J. Tumbrink	
Smart Booster—New Key Element for Brake Systems with Enhanced Function Potential (950760)	171
Karlheinz Bill, Jürgen Balz, Jürgen Böhm, Martin Semsch, and Peter Rieth	
Intelligent Braking for Current and Future Vehicles (950762)	179
Donald E. Schenk, Richard L. Wells, and John E. Miller	
Wheel Bearing with Integral Speed and Temperature Sensor for Anti-Lock Braking Systems (950943)	183
Jonathan Adler	
Potential of Electronically Controlled Brake Systems (952278 E)	189
Christian Wiehan and Detlev Neuhaus	
Electromechanical Brake System: Actuator Control Development System (970814)	199
Christof Maron, Thomas Dieckmann, Stefan Hauck, and Hubertus Prinzler	

Use of a Hazard and Operability Study for Evaluation of ABS Control Logic (970815)	205
Michael J. Schneider	
Design of a Brake by Wire System Using OOA (960992)	215
Manjinder Singh and Barry Bridgens	
Electrohydraulic Brake System—The First Approach to Brake-by-Wire Technology (960991)	221
Wolf-Dieter Jonner, Hermann Winner, Ludwig Dreilich, and Eberhardt Schunck	
Brake by Wire for Commercial Vehicles (922489)	229
Jürgen Wrede and Heinz Decker	
Fuzzy Logic Continuous and Quantizing Control of an ABS Braking System (940830)	241
Georg F. Mauer, Gérard F. Gissinger, and Yann Chamaillard (10)	
Development of Fuzzy Logic ABS Control for Commercial Trucks (952673)	251
Mark Akey	
Development of the Brake Assist System (980601)	261
Hiroaki Yoshida, Tatsuo Sugitani, Masashi Ohta, Jiro Kizaki, Atsushi Yamamoto, and Koji Shirai	

Traction Control Systems (TCS, ASR)

Fuzzy Logic Approach to Traction Control Design (960957)	271
Ka C. Cheok, Francis B. Hoogterp;, Walter K. Fales, Kazuyuki Kobayashi, and Sandro Scaccia	
Analysis of Traction Control Systems Augmented by Limited Slip Differentials (940831)	277
Robert K. Holzwarth and Kenneth A. May	
Traction Control (ASR) Using Fuel-Injection Suppression—A Cost Effective Method of Engine-Torque Control (920641)	287
Bernward Böning, Reiner Folke, and Knut Franzke	
The Corvette Acceleration Slip Regulation (ASR) Application with Preloaded Limited Slip Differential (920642)	295
Dick D. Hoffman	
Development of the Electro-Magnetic Controlled Limited Slip Differential Unit (EMCD) (931023)	309
Masao Teraoka	
Traction Control and Modeling of Tracked Vehicles (942375 E)	319
Zhejun Fan, Yoran Koren, and David Wehe	
Practical Ruled-Based Vehicle Traction Control (942402)	327
Zhejun Fan, Yoram Koren, and David Wehe	

Traction Control for a Formula 1 Race Car: Conceptual Design, Algorithm Development, and Calibration Methodology (942475)	333
Kim Lyon, Matthias Philipp, and Erwin Grommes	
A Survey of 4WD Traction Control Systems and Strategies (952644)	345
Sankar K. Mohan and Randolph C. Williams	

Stability Control Systems (VDC)

New Driving Stability Control System with Reduced Technical Effort for Compact and Medium Class Passenger Cars (980234)	365
Heinz Leffler, Reinhard Auffhammer, Reent Heyken, and Harald Röth	
VDC Systems Development and Perspective (980235)	373
Anton T. van Santen, Rainer Erhardt, Klaus Landesfeind, and George Pfaff	
VDC, the Vehicle Dynamics Control System of Bosch (950759)	395
Anton T. van Zanten, Rainer Erhardt, and Georg Pfaff	
Simulation for the Development of the Bosch-VDC (960486)	413
Anton Th. van Zanten, Rainer Erhardt, Albert Lutz, Wilfried Neuwald, and Hartmut Bartels	

Combination Systems

Electronic Brake Management EBM—Prospects of an Integration of Brake System and Driving Stability Control (960954)	427
Heinz Leffler	
Combination of Antilock Brake System (ABS) and Combined Brake System (CBS) for Motorcycles (960960)	441
Masaie Kato, Takushi Matsuto, Keishin Tanaka, Hiroshi Ishihara, Tatsuo Hayashi, and Wasaku Hosoda	
The Brake System of the New 7 Series BMW with Electronic Brake and Wheel Slip Control (950792)	449
Heinz Leffler	
Consideration of Lateral and Longitudinal Vehicle Stability by Function Enhanced Brake and Stability Control System (940832)	465
Heinz Leffler	
Automated Software Verification Supporting ABS TCS Safety Design (940834)	475
Torsten Sauer	
An Advanced Braking and Stability Controller for Tow-Vehicle and Trailer Combinations (931878)	485
Mark Elwell and Scott Kimbrough	

ABS5 and ASR5: The New ABS/ASR Family to Optimize Directional Stability and Traction (930505)	499
Wolfgang Maisch, Wolf-Dieter Jonner, Robert Mergenthaler, and Alfred Sigl	
ASR Built in an Add-On ABS (930506)	507
Akihiko Sekiguchi, Toshifumi Maehara, Takashi Sakai, Hideki Kakizaki, and Satomi Ohkubo	
Scope for the Integration of Powertrain and Chassis Control Systems: Traction Control—All-Wheel Drive—Active Suspension (901168)	517
Henning Wallentowitz	
Development of Integrated System Between Active Control Suspension, Active 4WS, TRC and ABS (920271)	533
Hiroshi Kawakami, Hiroki Sato, Masaaki Tabata, Hideo Inoue, and Hidenori Itamaru	
Transputer-Based Real-Time Simulator—A High Performance Tool for ABS and TCS Development (920643)	541
Helmut Fennel, Sascha Mahr, and Rüdiger Schleysing	
Increasing the Safe Driving Envelope—ABS, Traction Control and Beyond (92C014)	559
David R. McLellan, Joseph P. Ryan, Edmund S. Browalski, and John W. Heinrich	
Tandem Master Cylinder in Change—Due to Specific Requirements of Anti Lock and Traction Control Systems (930504)	581
Gunther Buschmann, Manfred Roth, and Kurt Saalbach	
Autonomous Intelligent Cruise Control Incorporating Automatic Braking (930510)	591
Peter Martin	
Hydraulic Test of ABS/TR Brake System and Modeling (942380)	599
Durk Wuh	

What the Future Holds

Future Developments in Electronically Controlled Braking Systems	605
Ross Bannatyne	