



Advanced Chassis Systems Report

Published September 2011, this first edition 181 page report looks at the key development drivers in the sector and provides analysis on chassis performance.

The report provides detailed sections on suspension systems, steering systems, braking system development and four-wheel steering. Furthermore the report includes profiles of 27 major players in this sector.

Background to this research

From a technical standpoint modern chassis systems can today realise almost any imaginable comfort characteristics, and the limiting factor in this respect as far as the customer is concerned is cost.

However, many OEMs today see the building of brand loyalty through the chassis system characteristics as a simultaneous process as enhancing manufacturing and vehicle efficiency, although fine tuning the chassis in order to enhance model or brand specific characteristics is in reality noticed by very few drivers.

In fact the widespread introduction of low rolling resistance tyres as original equipment on today's vehicles has taken away one element of vehicle dynamics tuning that was extensively used by OEMs in press launch, where different tyre compounds could be used to enhance the driving dynamics with this influential group of drivers.

Furthermore, the increasing regulatory pressure for lower CO2 emissions is persuading OEMs that not only is reducing weight, and particularly unsprung weight, good for vehicle dynamics, weight reduction is also a critical contributor to greater vehicle efficiency.

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- Increasing influence of electrification
- Chassis performance
- Design compromise
- Manufacturing economics
- Platform development and component commonality
- Noise vibration harshness

Key Development drivers

- Greenhouse gas emissions and fuel efficiency
- Noise vibration harshness
- Chassis materials developments
- Increasing electrification
- Systems integration
- The packaging dilemma
- The future for chassis design

Suspension systems

- Challenges and barriers
- Suspension developments: passive on its way to active
- Kinematics and elastokinematics
- Suspension element technology
- Control arms
- Spring systems
- Active body control
- Anti-roll bars
- Adaptive damping system
- Air suspension
- Active suspension
- Electronic Damper Control (EDC)
- Active Suspension Geometry (ASG)
- Semi-active suspension
- Active electronic suspension system
- Future trends

Steering systems

- Electrically Power Assisted Steering (EPAS)
- Surface acoustic wave
- Software enabled features
- Electro-Hydraulic Power Steering (EHPS)
- Electric Power Steering (EPS)
- Steer-by-wire
- Active Front Steering (AFS)

Four-wheel steering

- Automated parking
- Braking system development
- Anti-Lock Braking System (ABS)
- Electronic Braking System (EBS) or Electronic Brake Distribution (EBD)
- Brake Assist (BA)
- Mercedes-Benz SBC – an advanced mechatronic system

Autonomous emergency braking
Ceramic composite brakes
Brake-by-wire
Electro-hydraulic brake-by-wire
Electro-mechanical brake-by-wire
Regenerative braking systems and brake blending
Vehicle stability systems
Four-wheel drive (4WD)
Emissions and Fuel Economy
Active Torque Dynamics (ATD)
Safety and AWD
Technologies and Challenges
Electric AWD
Integration of Control Systems
Active All Wheel Drive (AWD)
Torque vectoring
Future trends
Chassis and corner modules

Supplier Profiles

Algat Industrie SRL
Autoliv
Benteler
Bharat Forge
Bosch
Brabant Alucast
BWI Group
Continental
ixetic
JTEKT
KYB
Magna
Magneti Marelli
Mando
Mubea
NSK
Schaeffler
Sogefi
tedrive Steering
Tenneco
ThyssenKrupp
Tower International
Trelleborg
TRW Automotive
VB
Wabco
ZF Friedrichschafen

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