

# Vehicle dynamics performance



## Services

- To develop chassis systems and complete vehicle through:
  - Benchmarking & target setting
  - Concept generation, optimization & detail design
  - Prototype development and validation
  - Active system development, MIL & HIL validation
- To improve internal processes
  - Definition of branding and product specification
  - Improve product quality and consistency
  - Improve working efficiency, reduce development costs
  - Further knowledge and understanding of system performance
- Providing training support & resident engineers
  - On/off-site training
  - On-site resources & support
- R&D leadership & participation
  - Large part of activities to maintain state of the art
  - FP7 framework, Internal, national and international

## Process

With the years of development experience coming from a wide range of professional backgrounds, Applus IDIADA has refined the development process to one that meets our customers' needs. In particular it:

- Offers a clear process-lead approach that guarantees we meet deliverables
- A flexible approach that works with all customer profiles and markets
- Under continual improvement to ensure customers benefit from all latest technologies and methods

## Resources

- Industry leading simulation capacities
- CAD, CAE development services
- Dedicated objective test teams

- Highly experienced tuning team
- Extensive proving ground and public road
- Wide range of laboratory facilities

### **Vehicle dynamic simulation**

Applus IDIADA chassis development team uses the latest CAE technology for simulating vehicle ride, handling and durability performance. Many in house techniques have been developed that allow integrated functional teams to work together. Typical simulation activities include:

- Chassis design & development
- Tuning support and target establishment
- Active safety & chassis control system development
- Suspension optimisation studies
- Ride comfort and durability analysis
- Powertrain installation and driveline analysis
- Tyre characterisation & development

### **Vehicle dynamics laboratory**

Chassis System Measurements: Suspension Characterization

- Kinematics and compliance measurements
- Passenger vehicle
- Motorbikes
- Motor sport vehicles
- Commercial vehicles (high capacity load cells)
- Measurements of suspension hard points
- Axle with very high load capacity kinematics and compliance measurements

Chassis System Measurements: Damper Characterization

- Suspension damping measurements

Global Body Characteristics

- Centre of gravity measurements
- Moments of inertia measurements
- Body torsional and lateral stiffness with K&C rig

Chassis Components Testing

- Steering characteristics with K&C
- Knuckle stiffness characterization
- Spring measurements
- Damper and bushing measurements
- Test bench: flexible laboratory
- Evaluation Methods