



**PERMANENT INTEGRATIVE  
SIMULTANEOUS TESTING  
EUROPE  
AUTOMOTIVE VALIDATION**



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## Why MODUS HISPANICA ?

MODUS Hispanica S.L. is the leading service provider for the holistic validation method by, testing automotive products in the reality of the entire system, focusing on the European market conditions.

### MAIN ACTIVITY :

Testing by durability runs for

- **SYSTEM VALIDATION** of total vehicle
- **MODULE VALIDATION** of modules & components

### VALIDATION EXPERIENCE :

**38 mio. km 1993 - 2008**  
23 mio. km **SYSTEM VALIDATION**  
15 mio. km **MODULE VALIDATION**

### SUBJECT :

**Anticipatory analysis of product quality & reliability by neutral, highly experienced experts, evaluators & engineers.**

### OBJECT :

**Passenger cars, motorbikes & light commercial vehicles.  
Production, pre-production & prototype vehicles.**

### CLIENT BENEFIT :

⇒ **increased efficiency & reduced warranty costs ;**  
⇒ **increased customer satisfaction.**

## What is PISTE ?

PISTE is a validation method for quality monitoring, anticipative customer satisfaction, functionality & reliability.

### PERMANENT

- 100.000 km with increased stress in 6 months, time optimized
- Equivalent to 160.000 km complete vehicle life of average European customer in 10 years

### INTEGRATIVE

- Holistic - entire vehicle - system
- Interactions between integrated sub-systems & components
- Coincidences provoked by random circumstances of drivers, climate, roads.

### SIMULTANEOUS

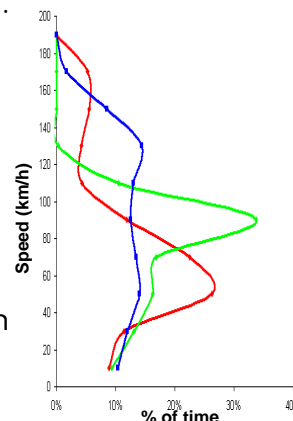
- Part of vehicle development process
- Interdisciplinary
- Hand operations over night

### TESTING

- Real world, on open roads
- Simple thinking in a complex system

### EUROPE

- 40.000 km Spain – Southern Europe
  - 25.000 km Germany – Central Europe
  - 25.000 km Slovakia – Eastern Europe
  - 10.000 km Sweden – Northern Europe
- with 10% trailer towing in each country



## Why PISTE ?

10% of OEM revenue is lost in quality issues, but can be reduced by using PISTE tool thanks to :

- Anticipated complete vehicle results
- European average
- no benches, simulation, proving grounds
  - ⇒ increased efficiency
  - ⇒ reduced costs
  - ⇒ increased customer satisfaction

Project management by experienced engineers.

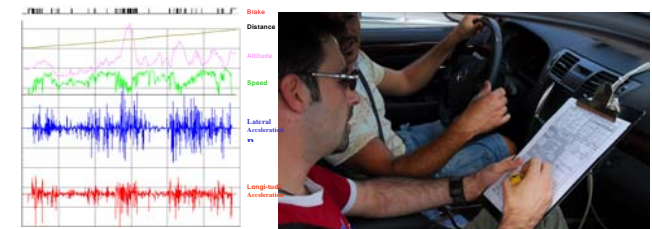
Mix of professional drivers representing European average : 30% female, age distribution.

Daily safety check & visual inspection, driving pre-defined routes & filling out logbook with comments & complaints.

Country & road distributions defined using number of vehicle registrations and road stress and scale factors for each area.

Subjective evaluations of brakes, chassis & total vehicle with rating 1-10 according to Subjective Evaluation Index.

Test run control 100% by GPS.



## What do we measure ?

**MODUS Hispanica S.L. performs measurements & engineering analysis:**

### Standard measurements & tests

- Suspension alignment & body level
- Tyre wear & expected lifetime
- Brake wear, runout & expected lifetime
- Position of engine silent blocks
- Accessory drive belt tension
- Fuel & oil consumption
- Dust penetration
- Stone chipping impacts
- Interior noise
- Empty tank test
- Tightening torque of bolts
- Climate data
- GPS data & brake events at 1 Hz
- Dealer service evaluation

### Special tests:

- Mountain & highway brake test
- Slalom & lane change
- Acceleration & max. speed
- Engine power & emissions
- TÜV general inspections



## What do we report ?

***Small & flexible company  
Easy & fast communication***

**Daily reporting** in case of urgent issues or breakdown.

### Weekly report using FTP server:

- Daily shift data : driven routes & mileage
- Fuel & oil consumption
- Detailed description of new complaints illustrated with pictures & measurement data

### Final report & presentation of results at end of test:

- Conclusion
- Main complaints & strong points
- List of all complaints
- List of disassembled parts
- Subjective evaluation results
- All measurement results
- All special test results
- Product improvement recommendations

