



FIAT CHRYSLER AUTOMOBILES



## Development of analysis tools for mechanical vehicle systems

### Motivation

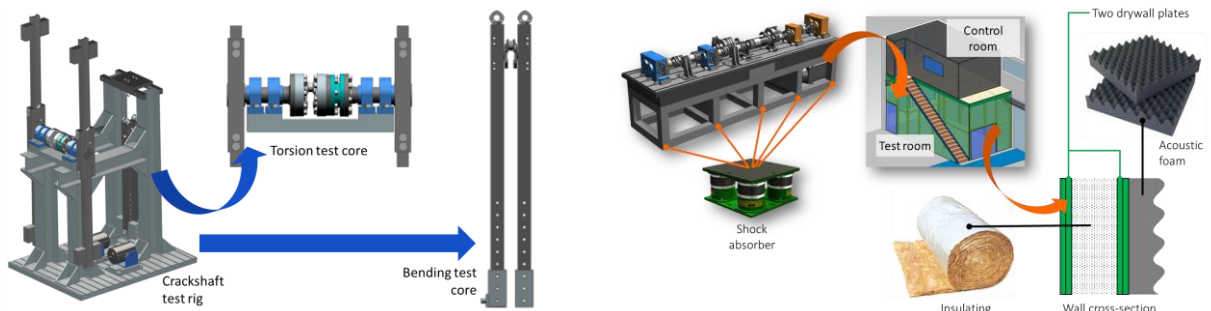
The increase of power and reduction of fuel consumption requires the development of machine elements that are capable of withstanding higher loads, while being able to be manufactured in smaller dimensions (reduction of raw material), generating an increase in torque efficiency and mass reduction. However, the lack of structure in Brazil for the execution of validation tests of components, whether due to changes in design or manufacturing process, is a notorious problem to be faced by the automotive industry

### Objective

Development of tools for analysis of vehicular mechanical systems for gears and crankshafts. Gears: development of a gear test bench that allows research in the areas of torque capacity, noise and vibration level (NVH), torque efficiency and thermal behavior. Crankshafts: Incorporate virtual design techniques into current FCA processes to eliminate or reduce the need for prototypes, developing the concept of a fatigue test bench.

### Approach

The study involving gears focused on the design and dimensioning of a fatigue test bench, torque efficiency, thermal dissipation and NVH. The crankshaft line focused on numerical simulations of the deep rolling process of crankshafts and also on the development of a fatigue test bench concept for these components.



Contact: +55 (12) 3947-6948

Praça Marechal-do-Ar Eduardo Gomes - Vila das Acácias  
São José dos Campos - SP, 12228-900

Project Responsible: Prof. Dr. Alfredo Rocha de Faria