

# ARAI Update

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Design, Development and Testing Services offered by  
Automotive Research Association of India, Pune

- 1) Wheel Force Transducer for Passenger Cars and SUVs
- 2) Material Compatibility Study with Gasoline and Ethanol Blended Fuel

## ❑ Wheel Force Transducer for Passenger Cars and SUVs

Structural Dynamics Lab (SDL) of ARAI has recently acquired a 16" wheel force sensor used for measurement of spindle forces and moments on a rotating wheel; a major constituent in modern vehicle development cycle.

Kistler make RoaDyn S635 measuring wheel has a modular, highly versatile design for mounting on different wheel hubs and rim geometries of vehicle. Simultaneous data of three spindle forces in longitudinal (Fx), lateral (Fy) and vertical (Fz) direction along with three moments Mx, My and Mz can be acquired precisely.

The same WFT can be used for non-spinning application on MTS 329 test rig available at SDL. Signals from WFT can be used directly for simulating acquired spindle forces.

With this sensor, vehicle instrumentation, vehicle testing / development time will be reduced substantially.



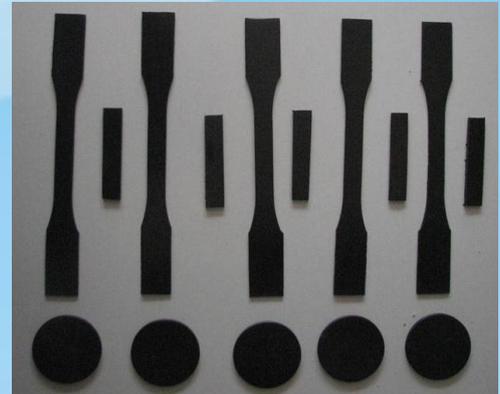
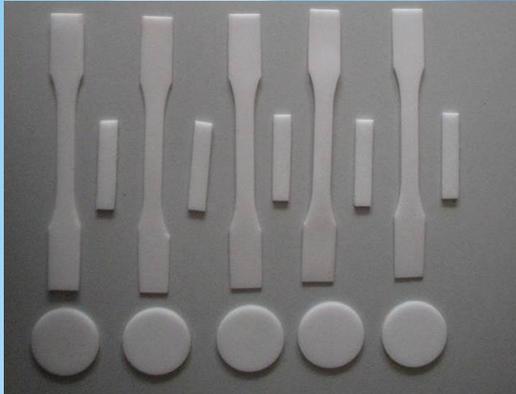
## Typical Applications

- ❑ Measuring operating loads during typical vehicle driving maneuvers
- ❑ Input data for design of new components and verification of design loads
- ❑ Measuring test stand control data for road simulators
- ❑ Investigation of vehicle behavior in specific or critical driving situations
- ❑ Input data for fatigue calculations and numeric simulations



## ❑ Material Compatibility Study with Gasoline and Ethanol Blended Fuel

Study project on evaluation of effect of 10% ethanol blended gasoline (E10) fuel versus commercial gasoline (E0) on polymeric materials (Elastomers and Plastics) used in automotive components is undertaken by ARAI. Few common elastomers and plastics used in automotive components are being tested as per the guidelines given in the standard, SAE J 1748 for non-metal compatibility study. Change in material properties like volume/swell, weight, appearance, tensile strength, elongation, impact resistance and hardness shore A will be measured after immersion of materials in the fuel in a periodic manner to evaluate impact of E10 fuel on materials relative to gasoline.



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**ARAI**  
Progress through Research

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