Advanced Durability Lab

Real Time Road Simulation

The Roush Advanced Durability Lab specializes in re-creating proving ground and real-world durability events in a controlled lab environment. This state-of-the-art test rig significantly reduces durability test time and allows full vehicle validation to be performed much earlier in the design process. The world’s only contract six-degree-of-freedom (6-DOF) spindle coupled road simulator provides the ability to reproduce complex, non-linear forces and motions as previously only attained on a proving ground. With a repeatable and highly accurate test method, in the lab, Roush has the tools to help its customers find answers faster.

Rig Specifications:

- Max Operating Frequency: 50 Hz
- Dynamic Spindle Force: 17,300 lbf
- Spindle Displacement: 15 inches
- Spindle Velocity 197 in/sec
- Max Payload 13,200 lbf
- Pump Capacity 450 gpm

Lab Features:

- Private, Isolated control rooms - Confidentiality is top priority
- 3,000 square feet of bed plate
- 450gpm central hydraulic pump (expandable to 900)
- Facility is designed and built to accommodate expansion to 2 rigs
- Component/ subsystem durability testing capacity

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Our Capabilities

**Flexible Test Rig Configurations**

**Floating Body**
- This full-vehicle test provides the most accurate overall stress distribution in the complete vehicle structure for non-maneuvering events. The vehicle body is allowed to float, and all loads are reacted by its inertia.

**Fixed Body**
- This single-axle test produces accurate loads in the vehicle suspension and allows simulation of maneuvering events (braking and cornering) along with rough road simulation. The vehicle body is grounded, or the suspension can be mounted into a fixed reaction frame.

**HSRC (Hybrid System Response Convergence)**
- HSRC allows testing to be conducted very easily in the development path
- Eliminates need to collect track data
- Perfect for saving time, multiple variants, incomplete vehicles, design changes, and no track access

**Component Durability**
- Up to 20 actuators for component testing
- Real Time durability testing at component level
- Load and displacement to meet the test requirements
- Dedicated component test area
- In-house fixturing

**Road Load Data Acquisition (RLDA) and Instrumentation**
- High channel count, mobile, vehicle data acquisition
- Strain gauge application and custom transducer design
- Durability CAE team for duty cycle creation and road correlation
- Test design and validation planning based on collected operational loads

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