

We have one goal — improving the noise and vibration quality of our customers' products. Roush delivers innovative, effective noise and vibration control solutions. By combining advanced analysis capabilities, comprehensive engineering services, and state-of-the-art facilities, Roush has become a proven partner in identifying and resolving challenging noise and vibration issues. Backed by the diverse capabilities of the Roush family of companies, we are uniquely equipped to provide turnkey noise and vibration solutions.

Roush... your silent partner in developing smoother, quieter products.

Brake NVH Engineering

Roush is a leading supplier of noise and vibration (NVH) control engineering services to the transportation industry. Roush engineers work in close collaboration with vehicle OEM, brake system and brake component suppliers to address common issues of brake systems:

- Squeal
- Judder
- Creep/groan/moan
- Roughness

We resolve brake noise issues through:

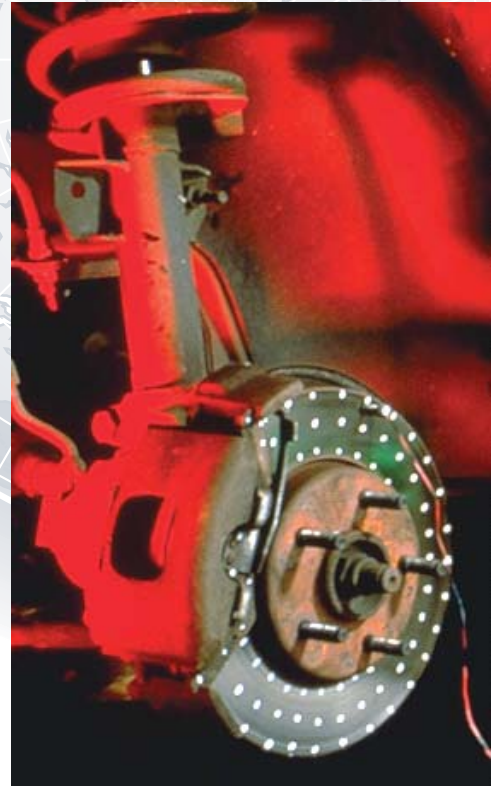
- Finding the root cause
- Minimizing vehicle sensitivity to brake inputs
- Structural and acoustic analysis
- Insulator material property development
- Optimizing insulator designs
- Developing countermeasures such as tuned dampers
- Vehicle validation

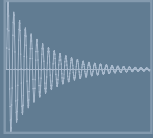
Our experienced engineering staff has a diverse background and excellent tools for solving a wide variety of NVH issues. We strive to find solutions that fit within brake performance and manufacturing constraints. Our brake noise dynamometer facility brings an excellent capability for diagnosing and solving noise and vibration issues in a controlled environment.

Roush Brake Noise Dynamometer Capabilities

This hemi-anechoic and environmentally controlled test cell is used by our engineering staff for noise matrix testing, root cause investigations, and countermeasure design validation. The facility can be configured to operate:

- Disk or drum assemblies
- Complete driven axle assemblies
- Complete vehicle corners
- Suspension parts and the road wheels may be included





NOISE AND VIBRATION ENGINEERING

Brake Noise Dynamometer Specifications:

Mechanical

- 100 HP drive motor system
- Maximum continuous torque of 2000 ft-lb (2700 N•m)
- Variable speed control 0-500 rpm
- Hydraulic pressure to 725 psi (50 bar)

Environmental

- -37°F (-35°C) to 185°F (85°C)
- Variable air flow
- Humidity control (10% RH to 95% RH)

Control

- Manual or computer-controlled data acquisition and dynamometer operation
- Roush's BrakeDAQ data acquisition system available

Damping Design and CAE

Our engineering staff utilizes the most current analysis techniques. Roush also has available the extensive resources of our viscoelastic materials laboratory, which contains a database of information on over 3,000 vibration reducing materials. These tools allow our engineers to optimize insulator and tuned damper performance as needed for brake system noise countermeasure design. Roush can support your design efforts with the following computational tools:

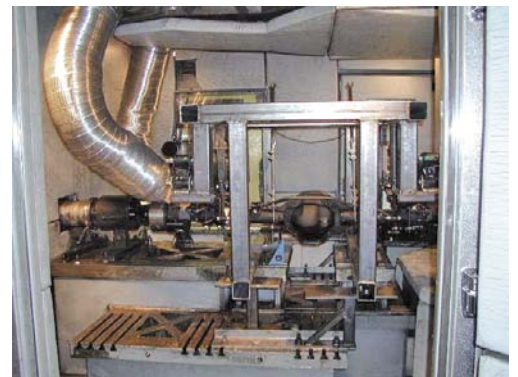
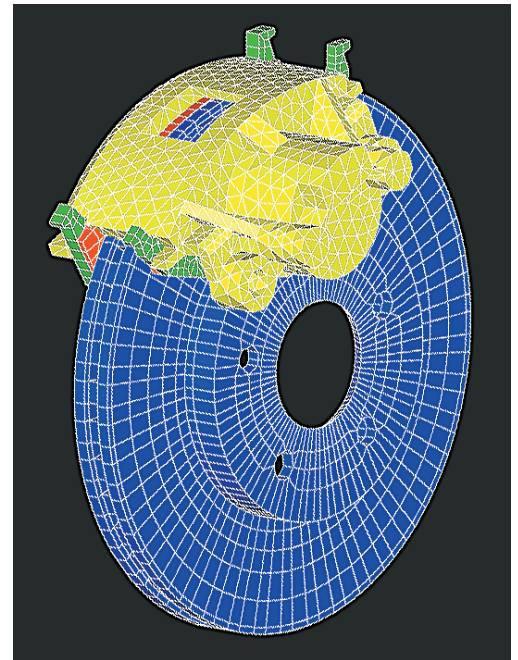
- Finite element analysis (FEA)
- Boundary element analysis (BEA)
- Mechanical system kinematics tools (ADAMS)
- Computational fluid dynamics (CFD)
- Damping prediction tools

Additional Brake Services

In addition to our high level brake system engineering services, Roush also supports the brake industry with:

- Los Angeles, Detroit, Minneapolis and Denver city traffic testing
- Death Valley brake drag tests
- Performance, dust, wear and durability testing
- FMVSS 105/135 testing
- Roush BrakeDAQ data acquisition system

The Roush BrakeDAQ system is a hardware/software road measurement tool that has been designed specifically for brake road testing, to output noise and performance data from typical vehicle tests.



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