



OFF-HIGHWAY & AGRICULTURAL EQUIPMENT TESTING & ENGINEERING

40 Years of Off-Highway and Agricultural Equipment Design and Test Experience

Your One-stop Source for:

- Testing
- Evaluation
- Systems Integration
- Certification
- Prototype Fabrication
- CAE/FEA
- Duty Cycle Definition
- Validation
- Accelerated Test Cycle Development
- Autonomous Vehicle Operations
- Instrumentation Services/Specialty Load Cells

NATC Tests To Worldwide

Standards including:

- SAE
- ASTM
- FCC
- MIL-STD
- STANAG
- DOT
- EC
- ISO
- FMVSS

- With more than 3,000 miles of test courses
- On site agricultural test fields
- On site functional gravel plant
- Cooperative agreements with local mines for vehicle evaluations
- User site instrumentation, data acquisition and failure analysis

Test Services

Development and validation testing for:

- Ride Characteristics
- Vibration
- Handling Characteristics
- Braking
- Suspension Design
- BSR/NVH
- Cornering/Stability
- HVAC
- Fuel Economy
- Noise/Acoustic
- Operating Efficiency
- Durability
- Full Load Cooling
- Sound Intensity
- Trailer Tow Interface
- End Limit Handling
- Hydraulic Controls
- Duty Cycle Development
- Low and High Temperature Operations
- Traction and Mobility Measurements
- Implement Efficiency Measurements
- Tire/Soil/Implement Interface Analysis
- Specialty Equipment Evaluations for Logging, Mining and Agricultural Applications

Engineering Services

- CAE/ CAD
- Structural Analysis
- Model Validation
- Failure Analysis
- ADAMS
- Consulting
- Instrumentation
- Finite Element Analysis
- Test Plan Development
- Pavement/Road Studies
- Accident Reconstruction
- Off Site Instrumentation
- Non Destructive Testing
- Vehicle Dynamics Simulation
- ADAMS/Hydraulic Controls Integration
 - Measurement of unique field and operational conditions worldwide

- Integration of Unique Conditions into Virtual Proving Ground Environment

Powertrain Development and Testing

- Powertrain Development
- Cooling
- Chassis and Cycle Dynamometers
- Environmental

Accelerated Life Cycle Testing

Reduces product development time, yet still provides certified real-world testing. By using direct road roughness measurements and implement events, supported by computer simulations and environmental chamber test cycles, NATC can provide accurate test scenarios to rapidly identify problem areas and validate corrective actions.

- Duty Cycle Development
- Life Cycle Cost Analysis
- Operating Cost Analysis
- Ton Mile / Hour

Tire Testing

Specialized tests required for tires used in off-highway applications.

- Tire Traction On and Off Road
- VCI Measurement
- Soft Soil Mobility
- Run-flat Compatibility
- Beadlock Performance
- Thermal Profile
- Treadwear and Durability
- Mechanical Reliability
- Repairability
- Retreadability
- User Representative Tests
- Overload / Under Inflation
- Tire Ground Interface Pressure
- Central Tire Inflation Systems
- Tire Damping Measurement

Test Courses

A unique variety of soil types and terrain configurations are used to establish both traditional test courses and road simulators representative of conditions anywhere in the world.

- Worldwide Simulators
- Standard Shock and Vibration Courses
- Reference Ride Quality Test Courses
- Other Test Areas
 - Prepared slopes up to 60 percent longitudinal, 40 percent lateral
 - Rice Paddy Simulators
 - Agricultural Fields (3500 Acres)
 - Operational Gravel Plant
 - Mining And Logging Environments
 - Tilt Table
 - Full Vehicle Environmental Chambers
 - Accelerated Corrosion Test Chambers
 - Deformable and Non-Deformable Measured Reference Ride Quality Courses
 - Smooth to Severe Cross-Country, Battlefield Simulators
 - Sand and Soft Soil Mobility Areas

Dedicated Winter Test and Vehicle Dynamics Area

Secure 97-acre complex, 160,000-square-foot vehicle dynamics area, plus a 500,000-square-foot area for evaluation of tire traction and vehicle performance.

Advanced Capabilities and Concepts

NATC applies state-of-the-art technologies to numerous types of specialized vehicles. Our technical staff provides engineering and design support for concept development and can integrate new systems into existing vehicles.

- **Soil Bins for Traction and Mobility Testing**
- **Tillage Testing with over 1000 acres in Cultivation**
- **Hitch and Implement Development and Testing**
- **Traction Optimization (Electronic and Hydraulic Control)**
- **Human Factors Engineering / Operator Efficiency**
- **Multi Axle Applications**
- **Piggyback Testing**
- **Systems Automation/Closed and Open Loop Control**
- **Support for Tier One and Tier Two Component Suppliers**
- **Utility User Definitions**
- **Defining Component Operating Environments**
- **Alternate Fuels - Technology/Electric/Hybrid-Electric**
- **Mass Properties**
- **Anti-lock Braking Systems**
- **Traction Control Systems**
- **Central Tire Inflation Systems**
- **Active and Semi Active Suspension System Development**
- **Autonomous Vehicle Control/GPS Integration**
- **Thermal Imaging/Thermal Profiling**
- **System Interface Among:**
 - **Electronic Engine Controls**
 - **Electronic Transmission Controls**
 - **Automatic Transmission Retarders**
 - **Engine Exhaust Brakes**
 - **ABS/TCS Controls**
- **On-Board Diagnostic Systems - J1939/Prototype Systems**