

Systems TEST

ENVIRONMENT • DURABILITY • FATIGUE • REPEATABILITY

- Components & systems validated off vehicle
- Cyclic operation or loading
- Environmental conditioning & performance
- Standard or complex inputs
- Replicate road vibration

The Component Test Laboratory incorporates the ideas and experience gained over 35 years of testing both whole vehicles and components. This experience has enabled a system of modular test units to be developed which can be readily adapted to perform a large range of tests.

Millbrook operates two Laboratory Life Simulation Facilities which enable life simulation testing of automotive systems such as cockpit modules, doors, seats and front end cooling modules. The facility combines vibration in six degrees of freedom with high and low temperature, humidity and infra-red ageing. Operation of features such as glove boxes, cup holders and infotainment systems during vibration is provided by remote actuation. The low operating noise of the Team Cube™ enables squeak and rattle appraisals to be carried out in-situ during the test.

Durability and fatigue rigs are custom-built to provide a bespoke test solution with no compromises in their mode of operation. Repeated loading is applied to systems or structures using load cases determined from customer requirements, industry standard or road load data. Repeated operation of switches and mechanical systems is achieved using pneumatic actuators with PLC control. Accurate replication of in-service conditions and faithful duplication of field issues can be achieved under controlled and repeatable conditions.

Vibration tests are carried out in accordance with a wide range of military, commercial and customer-owned specifications on test items up to 350kg mass. Tests are conducted with sine, swept sine, resonance dwell or random vibration excitation. Complex structures are monitored during tests and full analysis carried out. Tests can be conducted keeping specimens in their in-service orientation using a vibration slip table, while shakers can be combined with climatic chambers. Tests are further enhanced by operating test specimens, either electrically or mechanically.

Environmental chambers are available to accommodate any size of test piece, up to a double decker bus, with tests further enhanced by the addition of solar load simulation and chemical or dust contamination reproducing just about any real-world climate.

Technical SPECIFICATIONS

Test Equipment

- Fanuc robot
- Large bedplate areas
- 4-post shaker system with comprehensive control package (2 post shaker for motorcycles)
- Electromagnetic shakers up to 2 300 kgf
- Sine/random/shock vibration controllers
- Vibration slip table
- Servo-hydraulic actuators up to 30 tonnes with digital load control system
- Pneumatic actuators
- Electronic Programmable Logic Controllers (PLC)
- Noise enclosures
- Salt spray corrosion chamber
- Environmental hot & cold chambers with humidity and vibration up to 18m3
- Dust chamber

Team Cube™ Multi Axis Shaker Table in climatic chamber

- Vibration in 6 degrees of freedom
- Max payload: 500 kg
- Max dynamic force: 62 kN
- Vertical displacement: 100 mm
- Low operating noise
- Component mounting to vertical faces
- Temp rate of change: 1°C/min
- Sun load simulation
- Removeable mid floor
- Accessory actuation
- Hot coolant flow & pressure
- Contamination application
- Sound quality analysis
- Working area dimensions: 3m x 3m x 2m high
- Frequency range: 2-250 Hz
- Max Acceleration: 5.1 gn
- Lateral displacement: 50 mm
- Expander head 1.5m x 1.5m
- Temp range: -40°C to +120°C
- Humidity range: up to 95% RH
- Acoustic absorption panels
- Full road load simulation
- Actuation effort measurements
- System high pressure pulsing
- Subjective NVH evaluation
- Binaural head

Millbrook OVERVIEW

Millbrook is one of Europe's leading locations for the development and demonstration of every type of land vehicle, from motorcycles and passenger cars to heavy commercial, military and off-road vehicles. Located at the geographical centre of the UK automotive and fuels industry and situated centrally in the strategic Oxford to Cambridge Arc just 65 kilometres to the north of London, our custom-built facility provides virtually every test, validation and homologation service necessary for today's demanding programmes, complemented by a worldwide reputation for confidentiality, service and competitiveness.

Although significant work has been done commercially on behalf of many research organisations, Millbrook has always focused on real world applications and understand the constraints, limitations and budgetary controls that affect our customers. Our staff have experience and expertise from backgrounds in test work within vehicle manufacturers' engineering departments, so they know what their customers expect from a test. Putting working relationships first, and seeing things from the customer's point of view, means Millbrook's support will survive the test of time.