

### GIANT INERTIA BRAKE DYNAMOMETER GIANT EVO NVH





HORIBA

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The GIANT *Evo* NVH is the largest dynamometer within the GIANT *Evo* family. It is a full-size NVH inertia brake dynamometer for basic and advanced NVH testing. It is used to test a variety of vehicle brakes and assemblies. This includes disc and drum brakes from small to large cars as well as brake systems of medium-sized SUVs.

The GIANT *Evo* NVH offers a whole range of functions for realistic and fully automatic NVH tests. Due to its various optional features it is able to meet special customer requirements also for sophisticated NVH investigations.

Due to its special design the GIANT *Evo* NVH is particularly suitable to perform NVH investigations with complete axle structures and suspension strut assemblies. Also basic performance procedures are feasible if the test brake is mounted to the test flange via a joint shaft as a brake disc, caliper and original knuckle assemblies. Furthermore assemblies with a standardized reusable HORIBA machine knuckle and wheel bearing can be connected to the dynamometer.

Particularly with regard to NVH tests, the GIANT *Evo* NVH has two separate machine frames, one for the NVH testing station and the other one for the drive unit. Thus, the NVH testing station is designed with a maximum interior noise level of 55dB (A)\*.

Due to the precise inertia simulation and state-of-the-art test brake control, investigations are conducted under realistic operating conditions. Therefore the standard scope of supply includes a climatic chamber for performing climatic tests from -20°C up to +50°C (optional -40°C to 50°C). Depending on customers' requirements, the NVH testing station can be either configured with a large testing station frame (3.5m x 3.5m outer frame dimensions) or with a smaller testing station frame (1.1m x 1.8m outer frame dimensions). The climatic testing chamber has the same size for both variants.

\*measured according to HORIBA instructions.

# Properties of the GIANT Evo NVH

#### Especially suitable for NVH testing:

- Inertia brake dynamometer optimized for NVH investigations
- HORIBA clamping angle with standardized hole pattern for easy adaptation of McPherson corner
- Two separate machine frames, one for the NVH testing station and the other for the drive unit
- Powertrain with sound absorbing housing
- Very low noise and vibration amplitudes
- Noise insulation of the test station with max.
   interior noise level of 55dB (A)\*
- Test station design prepared to meet the GM-TIP requirements
- Machine frames resting on vibration isolation. No vibrational cross talk to nearby machines
- Test chamber for testing at climatic conditions

#### Compact plug & play design:

- Including torque measuring flange
- Dynamometer already pre-wired
- Initial commissioning already completed prior to shipping
- Installation directly on factory floor, no seismic foundation block required
- Mechanical inertia simulation with base inertia and two attachable flywheels
- Powerful electric motor for accurate electrical inertia simulation

## Maximum precision with HORIBA brake actuator HBA 2200:

- High-precision actuator for braking pressure and torque
- Actuation by linear electric motor
- Installation close to the test brake
- Reduction of mechanical hysteresis
- Low maintenance costs due to reduced wear
- Fast adaptation close to the test brake

## Extremely high measurement repeatability:

- High-precision measuring systems for speed, brake pressure, brake torgue and temperature
- Fast data capture up to 1 kHz with HORIBA's measurement and automation system STARS Brake
- Digital filters adjustable for each channel
- High reproducibility of the measurements through accurate control of the test bench functions with SPARC Brake controller
- STARS Brake includes the commonly used brake test procedures to enable easy starting of test runs
- Direct analysis and result visualization with National Instruments DIAdem<sup>®</sup> Software
- Signal conditioning with EtherCAT modules to minimize electrical noise
- Easy to expand with optional components (see options)
- · Reproducible air flow for precise cooling of the brake systems

#### **Optional Features:**

- Dynamic ventilation system for basic cooling air supply
- Environmental simulation system for dynamic temperature and humidity control
- Water and dust spray systems for advanced environmental simulation
- Auxiliary drive for static brake testing
- HORIBA Brake Actuator HBA 2100 for actuating parking brakes with wire cable
- Advanced and integrated NVH measuring system, including squeal detecting algorithms
- HORIBA tailstock for highly accurate torque measurements
- HORIBA residual drag torque tailstock for highly accurate drag torque measurements
- Brake fluid displacement measurement used to investigate the volume consumption of the brake caliper
- Different pressure ranges and additional
   pressure sensors
- Disk Thickness Variation (DTV) measurement with up to six channels
- Telemetry system to measure up to eight rotating temperature channels
- Siemens mobile panel with touch screen for manual dynamometer control integrated in HORIBA's human machine interface
- Video camera installed in the testing station for monitoring and recording of investigations
- HORIBA support for the installation of the inertia brake dynamometer

Technical Data:					
Main Drive	DC-Drive				
Power (without overload)	220 kW				
Speed Range	+/- 0 2,200 rpm				
Max. Drag Torque (without overload)	2,500 Nm				
Max. Stop Braking Torque	+/- 0 5,500 Nm				
Flywheels Set	20 + 25 + 55 kgm <sup>2</sup>				
Flywheel Combinations	20 / 45 / 75 / 100 kgm <sup>2</sup>				
Inertia Simulation Range (incl. Electrical Inertia Simulation)	5 200 kgm² (valid for max. R <sub>dyn</sub> 316mm within velocity range 0-100Kph and deceleration 08m/s²)				
Max. Hydraulic Pressure	200 bar				
Max. Pressure Gradient (depends on the test brake)	1,000 bar/s				
Max. Volume Displacement	18 cm <sup>3</sup>				
Climatic Simulation Range	-20 50°C (optional -40 to 50°C)				
Ambient Air Temperature Range	5 40°C				
Dimensions (LxWxH) Including Power and Control Cabinets	approx. 7,750 x 3,500 x 3,000 mm				

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### Global Network

- Automotive Test Systems Facilities
- HORIBA Group Companies

### The Americas



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