

Tire and wheel assembly test equipment

High-quality tire and wheel assembly tests and measurements are essential to provide manufacturers with the vehicle ride quality demanded by their customers

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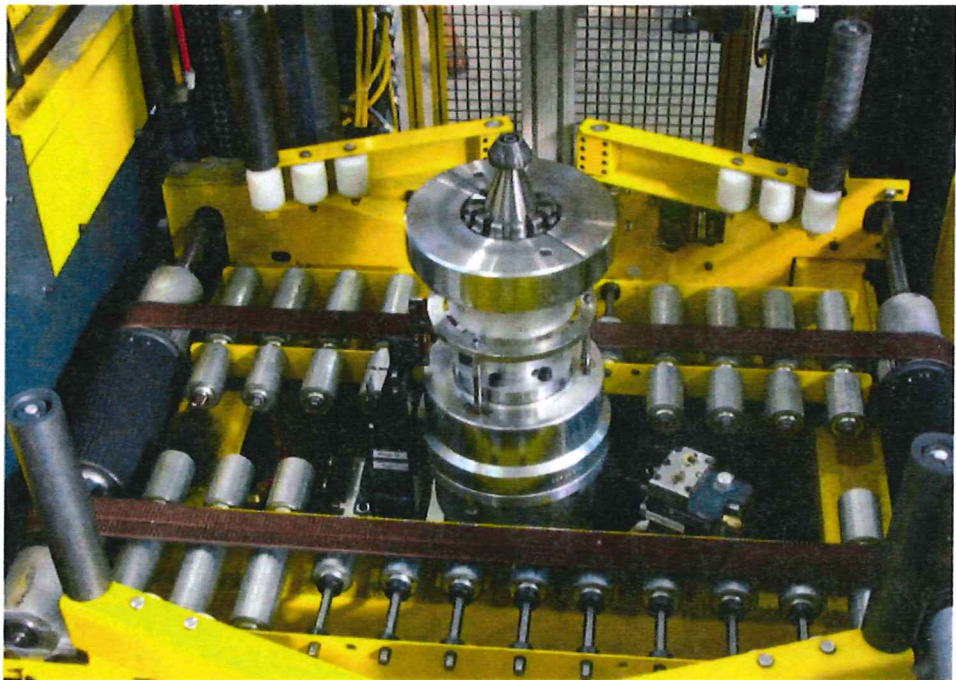
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➤ The automotive industry strives to achieve high-end user satisfaction that results in loyal, repeat customers. At the same time, manufacturers seek to reduce their warranty costs. In the tire and wheel assembly process, improving vehicle ride quality is important to the passenger and truck automotive assembly industry.

Manufacturers use mount and inflate equipment, uniformity measurement machines, dynamic balancers and weight apply equipment to produce, test and verify high-quality assemblies. For these integrated systems, the operating and maintenance costs need to be efficient, with high uptime expectations and low lifecycle production costs.

Micro-Poise Measurement Systems, with over 90 years of experience in the tire and automotive industries, is the global leader in providing precision-made test and measurement production equipment for tire and wheel assemblies. Micro-Poise works with Burke E. Porter Machinery Company to provide turnkey solutions in tire and wheel assembly and testing. Burke E. Porter is a leading supplier of tire and wheel automation assembly lines. Together, Micro-Poise and Burke E. Porter supply the industry with the products, knowledge and global support that today's automotive manufacturers demand.

BEP supplies advanced technology for tire and wheel



automation assembly processes with fully automated, semi-automated and standalone solutions. They provide patented automatic robot mounting machinery, bead seating equipment, and tire vision systems that work with the Micro-Poise test, measurement and weight apply equipment.

The combined solution quickly and efficiently matches tires with wheels and inflates them to specifications. The system then tests each unit for uniformity and balance to make sure only the best products reach final automotive assembly.

ABOVE: The Micro-Poise Model VTW Dynamic Balancer measures the imbalance of the tire and wheel assembly while it is spinning

BELOW: The tire and wheel assembler applies adjustment weights at measurement determined locations around the circumference of the tire and wheel assembly



When providing such solutions for its automotive customers, Micro-Poise addresses two specific forces that directly affect vehicle ride quality: variation of force around the tire and wheel assembly, and imbalance within the tire and wheel assembly.

Both forces produce vibration – a characteristic that automotive manufacturers want to minimize in their final assembly.

The Akron Standard Tire Evaluation Center (ASTEC) measures force variation around the circumference of the tire and wheel assembly when a load is applied that

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simulates typical vehicle operations. This is commonly called uniformity measurement. Uniformity measurement produces a variety of measured parameters which include radial force variation, lateral force variation, conicity, plysteer, radial runout, lateral runout, and sidewall bulge.

Uniformity variations can be a result of improper tire materials or construction, improper tire and wheel mounting, or from out-of-round wheels. Any of these variations can produce vibration. As more sources of vibration are investigated,

many automotive assemblers are now using such in-line automatic force variation test and measurement equipment to check for force variation. The goal is to remove any out-of-specification assemblies prior to reaching their customers.

In addition to uniformity measurement, dynamic balance measurement describes the forces generated by asymmetric mass distribution when the tire and wheel assembly is rotated without applying a load. The Micro-Poise Model VTW Dynamic Balancer measures the imbalance

of the tire and wheel assembly while it is spinning. Mass imbalance is measured for static, couple and plane imbalance. Measurement range is typical to 100g per plane radius. The tire and wheel assembler applies adjustment weights at measurement determined locations around the circumference of the tire and wheel assembly. This minimizes the final assembly's mass imbalance and ultimately minimizes automotive vibration.

Micro-Poise Measurement Systems' ASTEC force variation and VTW imbalance measuring equipment have been designed to work together with the Burke E. Porter robot mounting equipment, bead seating and visions systems to assure the world's highest quality of tire and wheel assemblies. Such systems have been installed throughout the world with many of today's leading automotive manufacturers and their tire and wheel assembly providers.

Automotive assembly teams recognize that a smooth ride begins with a good set of tires and wheels. It is the goal of the test and measurement provider, the tire and wheel equipment assembly provider and the automotive assembler to make sure that only the best product is provided. With the overall goal of reduced vibration in the final assembly, that product provides a smooth ride for the customer. ◀

BELOW: The Akron Standard Tire Evaluation Center (ASTEC) measures force variation around the circumference of the tire and wheel assembly when a load is applied that simulates typical vehicle operations

