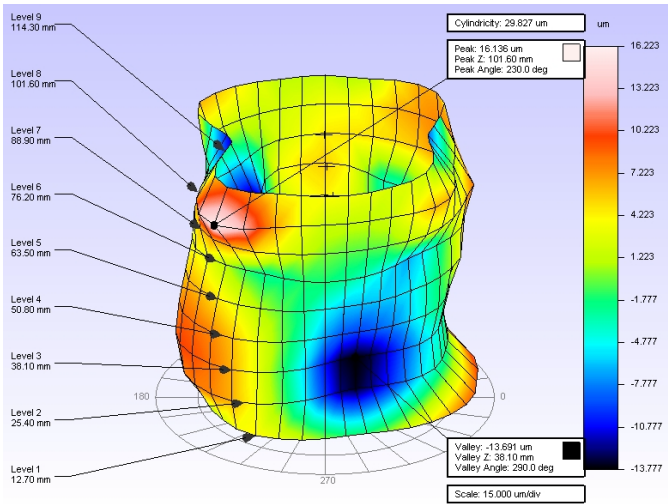
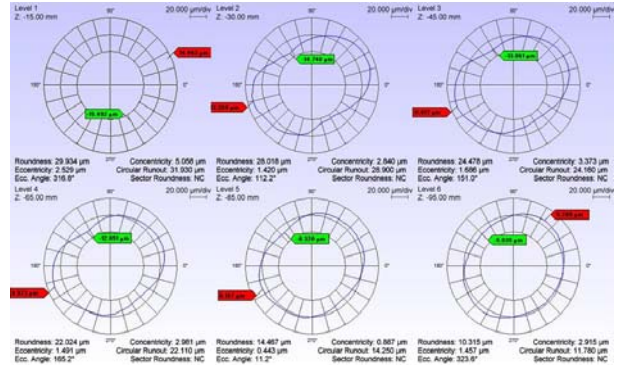


BEE 3-D[®] **Bore Evaluation Equipment in 3-D**

The cylinder bore geometry gage was developed to quickly check bores for roundness, cylindricity, and straightness. The **BEE 3-D[®]** system is computer controlled to give quick, accurate results to 1.0 micron (.000040"). The system can be used by engine manufacturers at all stages – initial design and testing, production quality control, wear testing, and torque plate validation.

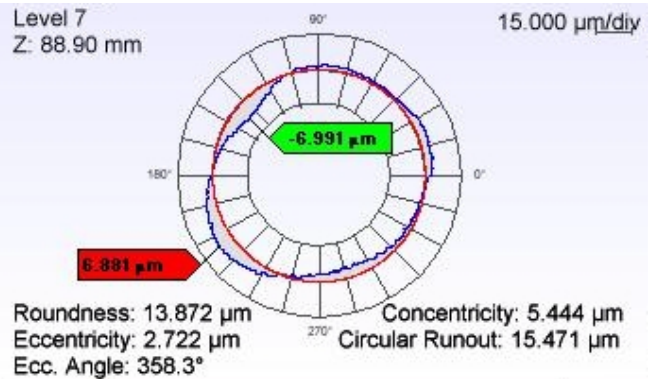


Hardware Features:

- Two probes for fast measurement – unit only has to rotate 180°
- Measures to 0.251" (6.4m) of top of bore with cylinder head in place
- Clamps at both ends of the shaft for effortless centering of gage in bore
- Sliding rear clamp to accommodate different bore lengths
- No cylinder head destruction
- Accommodates wide range of bore diameters without the need for shims

Software Features:

- Calculates void area between the ring and measured bore based on ring tension, material, and other parameters
- Easy-to-use Windows-based program
- 2-D measured results at each level
- 3-D measured bore can be viewed in a CAD-like environment making it easy to zoom and rotate to focus on any area of the cylinder bore
- Easy-to-read color gradients for displacements of the cylinder bore
- Ring geometry can be input to display ring-to-bore void areas

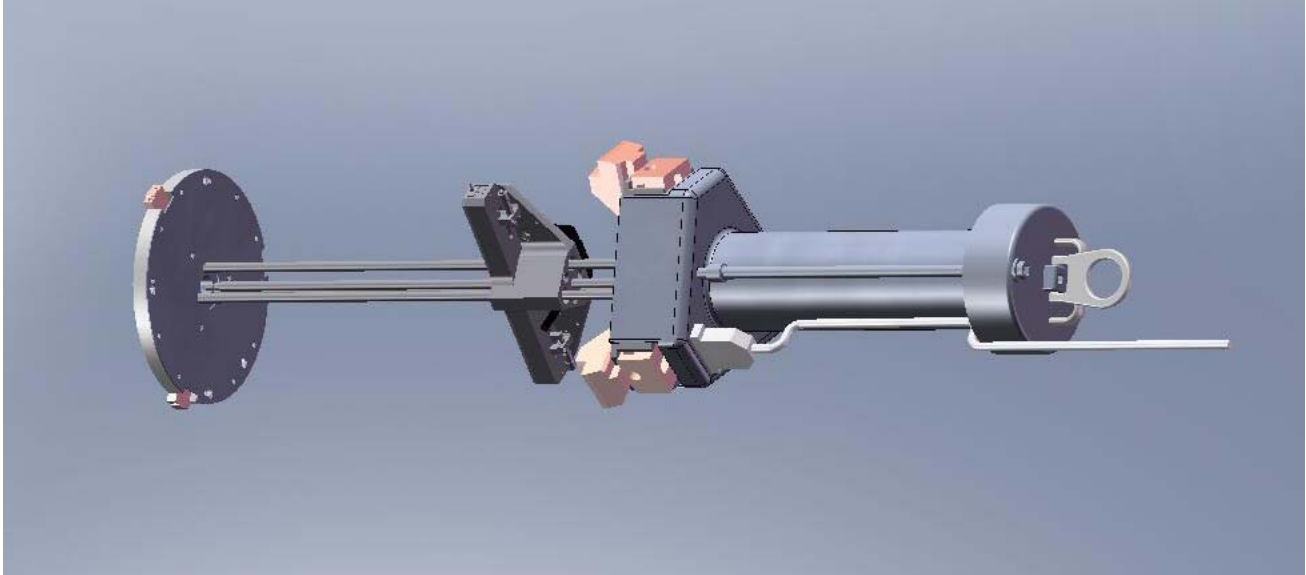


For additional information on this and other gage designs, please contact us at:

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Phone: 636/394-3331; Fax: 636/394-5844; Email: ckenginc@aol.com; Website: www.c-k-engineering.com

BEE 3-D[®]
Bore Evaluation Equipment in 3-D



Range Capability:

- Diameter – 225-305 mm (8.85-12.0")
- Length – 254-457 mm (10-18")

Precision (design objectives):

- Roundness $\leq 1.5 \mu\text{m}$
- Cylindricity $\leq 1.5 \mu\text{m}$
- Parallelism $\leq 1.5 \mu\text{m}$

System Components:

- Mechanical measuring device
- Electrical control/interface module
- TrueRond display software with integrated ring conformability model
- Laptop computer with proprietary Windows-based control software

Features & Benefits:

- Requires no cylinder head modification
- Measures shape at top ring turn-around
- Top and bottom clamps automatically locate gage in cylinder bore
- Dual measuring probes minimize measurement time
- Windows-based software
- Directly calculates ring face-to-cylinder bore void area
- Precision probes are protected from damage
- Precision probes have replaceable contact tips
- Adjustable clamp height
- Cost effective