

METROFORM

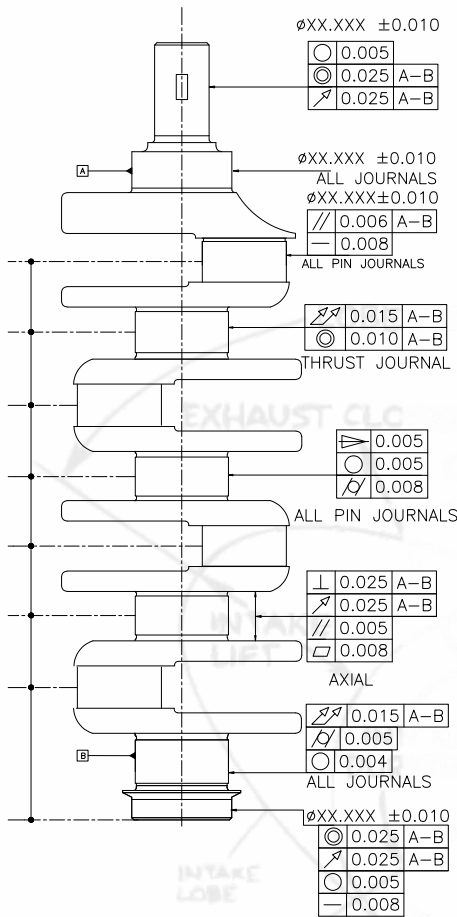
Crankshaft & Camshaft Metrology



Metroform

Crankshaft & Camshaft Metrology System

Measurement and analysis of precision crankshaft and camshaft



MetroForm is a three axis CNC vertical metrology system specially design for Crank and Camshaft measurements applications. Metroform system consists of Precision rotary spindle, two precision linear axes and the adjustable tail stock for easy loading of part in vertical position. The machine is constructed using granite base and isolated with anti vibration mount, this minimal foot print design allows the easy installation in production shop and inspection room. The MetroForm system integrated with advance data acquisition electronics and powerful MetroLab Software.

MetroLab is user friendly and easily programmable for various crankshaft and camshaft geometry. The system can measure the drawing parameters for the crank and cam shaft such as Linear, Angular and Form parameters. The software has an advance features such as sector roundness, lobbing and chatter analysis. MetroLab software display the results in graphical and tabulated formats, the measurement reports can be stored in PDF file format and easily recall for future references.



Features :

- Precision flat granite bed for high degree of Thermal or structural stability.
- High precision linear guiding system
- High precision carbide tip followers
- Window based software for easy program creation and editing facility.
- Easy diagnosis system for fault finding
- High resolution glass encoder system for both rotary and radial axis facilitates to have highest precise measurement data.
- Interchangeable hardened centres for tail stock and head stock.
- Different user level CNC and motorised operation.

Software feature

- Auto compensation for follower wear
- Auto detection of oil hole and automatic data filtration for roundness
- User-friendly programming
- Report customisation
- Graphical representation
- User level operation mode

System Specifications:	Metroform 360	Metroform 660	Metroform 1060
Part length	300 mm	600 mm	1000 mm
Swing diameter	150 mm	200 mm	200 mm
Follower stroke	120 mm	150 mm	150 mm
Part weight	75 kg	100 kg	100 kg
Spindle rpm (Programmable)	6 rpm	6 rpm	6 rpm
Radial Resolution	0.1 μ m	0.1 μ m	0.1 μ m
Axil Resolution	0.1 μ m	0.1 μ m	0.1 μ m
Angular Resolution	0.002 deg	0.002 deg	0.002 deg

Machine Dimensions :	Metroform 360	Metroform 660	Metroform 1060
Height	1300 mm	1600 mm	2000 mm
Width	550 mm	700 mm	700 mm
Depth	425 mm	425 mm	425 mm
Weight	270 kg	400 kg	470 kg

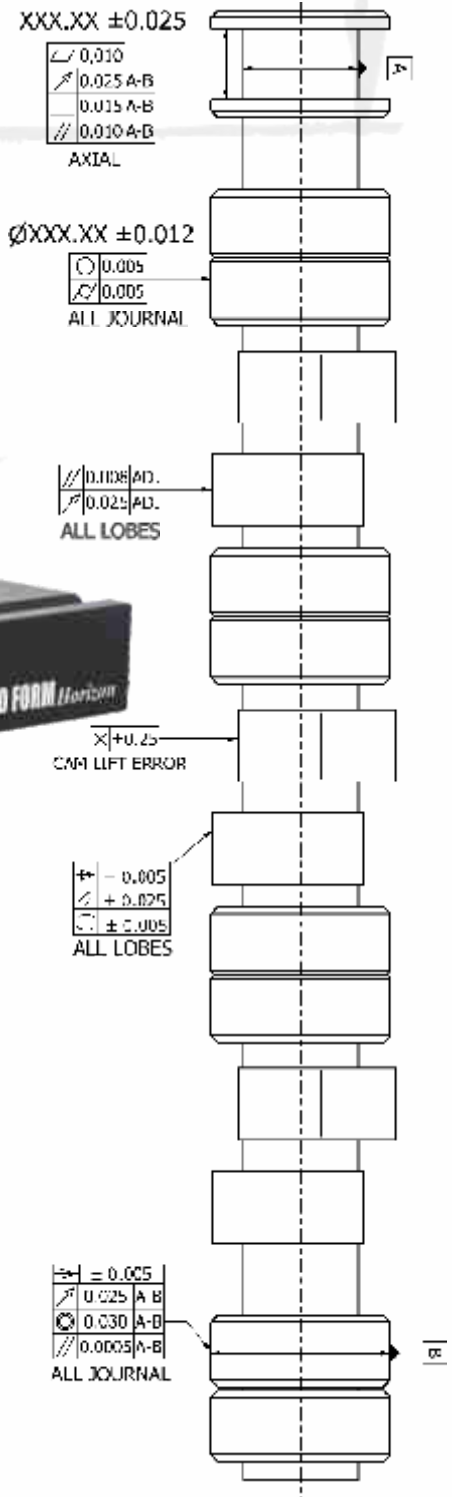
(Design / Specifications subjects to change without notice)

CRANK SHAFT MEASURING PARAMETERS
AT MAIN JOURNAL
• Diameter • Length • Width • Concentricity • Eccentricity
• Roundness • Sector Roundness • Run-out Radial & Face w.r.t. centre axis, Part journal axis • Straightness • Cylindericity
• Face Perpendicularity • Lobbing • Chatter analysts
AT PIN JOURNAL
• Diameter , Length , width • Roundness • Sector Roundness
• Straightness • Cylindericity • Parallelism • Index angle, Index position (angular,linear) • Lobbing • Chatter analysts
AT FLANGE
• Diameter • Roundness • Face run-out • Run-out Radial & Face w. r. t. centre axis, part journal axis • Face Perpendicularity
CAMSHAFT MEASURING PARAMETERS
• Roundness (LSC, MZC) • Surface Chatter • Lift / Lift Error
• Index Angle to Reference(s) • Cylindericity • Taper • Center Deviation
• Base Circle Radius • Diameter • Eccentricity • Velocity • Lobbing.
• Radius • Runout (radial) • Acceleration • Jerk
• Radius of Curvature • Pressure Angle

Metroform - Horizon

Camshaft Metrology System

Measurement and analysis of precision camshaft



Octagon Metro-Form Horizon is metrology system designed for rigorous metrological analysis of cylindrical parts specially automobile camshafts by using computerised analysis. Horizon series of Metroform provides facilitates easy loading / unloading of the component. The MetroLab software is designed to measure multiple lobes for its various dimensional parameters including lobe tip angles. Cam lobe data is automatically captured by rotating camshaft manually or with motorised spindle. Measurement can be taken using a round or flat measuring probes. Data is mathematically converted to the correct engine follower type and size. The machine is designed for standard room as well as shop floor measurements.

Features :

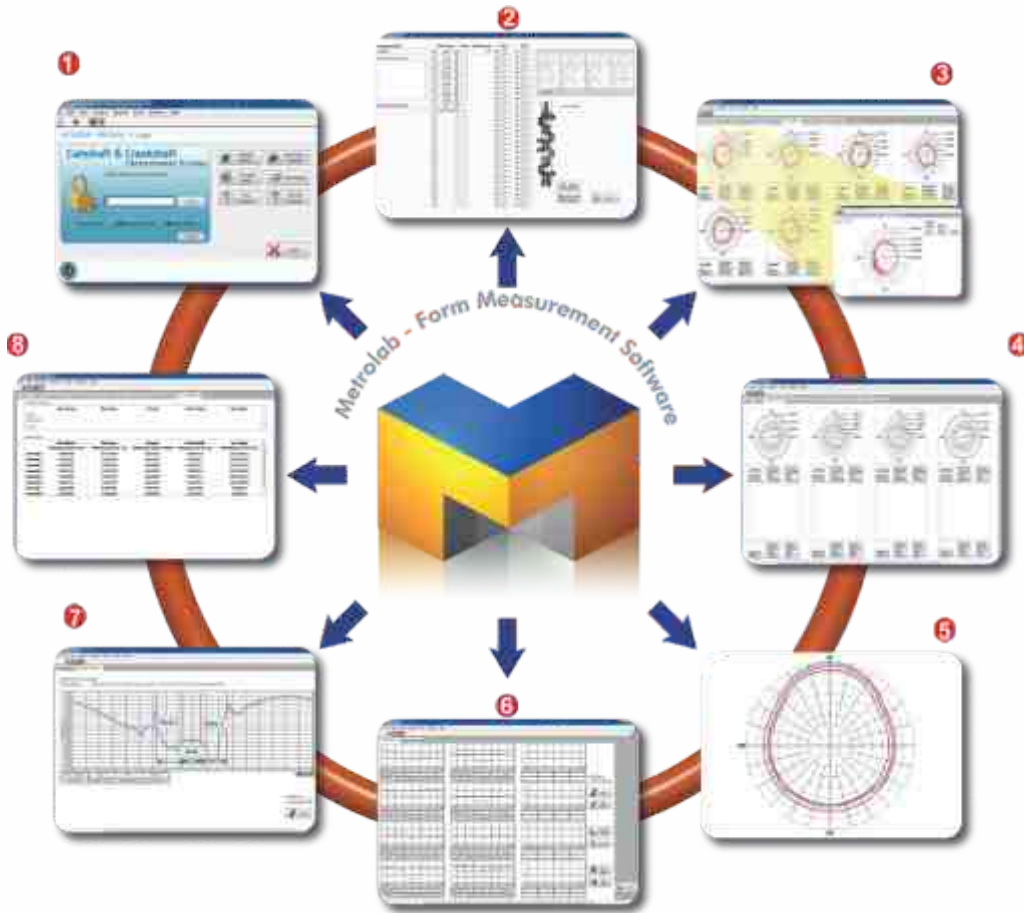
- Available in Manual / Motorised / CNC versions
- Precision flat granite bed for high degree of Thermal or structural stability.
- Durable carbide followers (flat and disc) as well as head/tailstock centres
- High resolution rotary and radial encoder system provides precise measurement data.
- Automated data acquisition reduces cycle time and eliminates manual errors.
- Lobe scanning with Fix measuring probe, regardless of engine follower size.
- Complete lobe measurement, graphical display and analysis of: lift, velocity, acceleration, jerk (3rd derivative), radius of curvature, pressure angle.
- Lobe data corrected to zero base circle runout.
- Angular position listing for all lobe tip angles
- Comparison of measured data with design data graphically as we as in tabular format.
- Graphic displays for all motion curves.
- Printed reports of screen graphics and tabular data
- Compare base circle radius, run-out and lobe tip angles to design data showing tolerance limits
- Inch or metric data input and output

CAMSHAFT MEASURING PARAMETERS			
• Roundness (LSC, MZC)	• Surface Chatter	• Lift / Lift Error	• Index Angle to Reference(s)
• Cylindricity	• Taper	• Center Deviation	• Base Circle Radius
• Diameter	• Eccentricity	• Velocity	• Lobing.
• Radius	• Runout (radial)	• Acceleration	• Jerk
• Radius of Curvature	• Pressure Angle		

System Specifications:	
Part length	500 mm
Centre Height	125 mm
Follower stroke	50 mm
Part weight	40 kg
Spindle rpm (Programmable)	6 rpm
Radial Resolution	0.1 µm
Angular Resolution	0.1 deg
Machine Dimensions :	
Height	350 mm
Width	375 mm
Length	1300 mm
Weight	250 kg

(Design / Specifications subjects to change without notice)

MetroLab is windows based software specifically designed for further mathematical analysis of measurement data of the cam profile to evaluate one degree output for lift, velocity, acceleration, jerk and radius of curvature. Different filters are provided for data smoothing. Output options include data analysis to the screen or a printer. Original data can be analyzed, smoothed and corrected for shaft eccentricity and base circle runout . The corrected data can saved for easy recall.



MetroLab - Form Analysis Software

- Menu driven and easy to use GUI's. Multilevel login allows the user to define and secure test setups and parameters.
- Single page test setup with drop down menus and graphics offer quick and error free configurations.
- Polar representation of crankpin and journal geometry.
- Polar representation of cam profile with user defined tolerance zone.
- Software can be configured to evaluate upto twelve cam lobes per test. Each cam lobe can be individually observed and plotted.
- Individual graphical analysis of cam lobes.
- Journal evaluated for various radial parameters.

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metrology

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