

BORE FINISHING



Precision Honing

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Connecting Rods

This is a typical example of high production bore finishing of automotive connecting rods. Both crank and pin bores are finished simultaneously with four diamond plated tools each. The rods are held securely on a locating plate, which is positioned on an X-Y (axis) floating fixture base. This allows the radial alignment of the two bores (bend and twist), along with perpendicularity to be locating surface to improve. The life of the diamond tools that are used on the forged steel crank bores average 100,000 parts; while the life of the diamond tools used on the bronze pin bores often exceed 1,000,000. This process has proven successful using either honing oil or specific types of water based coolant, even on the soft bronze bushing in the pin bore. Engis offers various packages for finishing connecting rods with production rates from 30 parts per hour all the way up to 720 parts per hour.

INDUSTRY: Automotive

MATERIAL: Crank Bore - Forged Steel / Pin Bore - Bronze Bushing

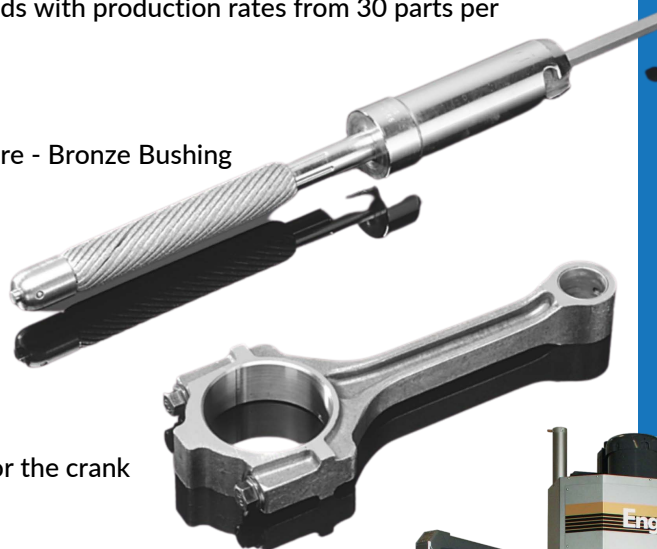
CHALLENGE: Inconsistent bore geometry

High down-time

High perishable tool cost

ENGIS ADVANTAGE:

- Improved Quality: Cpk: >2
- Improved bore roundness to better than Sum for the crank bore and 3um for pin bore
- Improved "Bend and Twist"
- Production Rate: 300 parts per hour
- Total perishable tooling cost for finishing both bores is roughly \$0.03.
- Quick change-over between part types
- Pin and crank bores finished together in the same machine



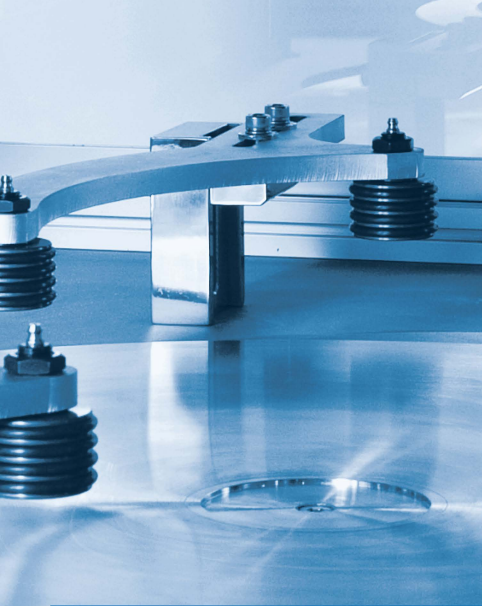
BORE QUALITY	CRANK BORE- FORGED STEEL		PIN BORE- FORGED STEEL	
	REQUIRED	ACHIEVED	REQUIRED	ACHIEVED
SIZE	0.010 mm	0.005 mm	0.006 mm	0.003 mm
ROUNDNESS	0.008 mm	0.005 mm	0.005 mm	0.003 mm
SURFACE FINISH	1 to 3µm Ra	1.7µm Ra	0.5µm Ra	0.3µm Ra

From tool and fixture design, through machine design, engineering and manufacturing, to process development, metrology, final run-off, automation packages, IIoT and secure remote monitoring, and in-field support.

We deliver machines, tools and automation; we pride ourselves on our ability to be innovators of cutting-edge honing technology.



World Leader in Superabrasive Finishing Systems



Lapping & Polishing



Superabrasive Tools



Bore Honing Systems



Engis® offers state-of-the-art technology in the design of flat lapping systems that meet the most demanding requirements.

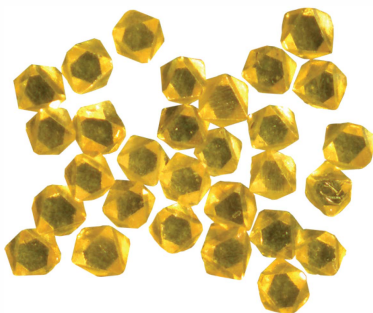


We offer a complete range of superabrasive electroplated products for precision applications.



Multi-Stroke Honing, Single-Pass Bore Finishing & Single-Pass Dual Bore Finishing Systems, Complete Machine Design, Tools & Process Development

Superabrasive Powders



We manufacture high-quality micron diamond & CBN with properties that ensure consistent performance in each application

Mold & Die Polishing



Engis® long trusted brands include Five-Star® diamond compound.

Engis Global Presence



US Engis Corporation



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Engis (Hong Kong) Ltd. Co., Ltd.



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Engis Korea



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Engis

ENGIS® CORPORATION
Leader in Superabrasive Finishing Systems
105 W. Hintz Road • Wheeling, IL
60090-6038 Phone: 847/808-9400
Fax: 847/808-9430
E-Mail: info@engis.com
Website: www.engis.com