

Article Abstract

Title:	Design and performance evaluation of a horizontal hydraulic honing attachment to lathe
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Abstract:	<p>The surface finish between two mating parts in an assembly has significant influence on the mechanical properties such as wear resistance, corrosion resistance, fatigue resistance and stress concentration. The choice of surface finishing operation such as honing and lapping is based on functional requirements of an assembly. As these processes are expensive, the design engineer should be cautious in assigning the quantified surface roughness value. Traditionally, honing is carried out in vertical direction. The process is capable of correcting the inner surface geometry while maintaining a surface finish band between 0.25 to 1 micron (μm). Cylinder liners, hydraulic cylinders, and gears are routinely finished by honing process. An attempt is made in the present work by retrofitting an existing lathe. A geared AC motor is mounted at the end of the lathe bed, and a fixture for holding a liner is mounted at the other end. The honing tool gets its primary motion from the geared motor and a hydraulic circuit is used for feed motion. Experiments are carried to evaluate the surface finish against the process parameters such as grain size, feed rate and speed. The results obtained are superior to internal grinding and are comparable to original honing. Surface roughness is measured for coarse, medium and fine grain honing shoes. Optimum feed rate, grain size are extracted from experiments. The work material considered for present investigations is a diesel engine cylinder liner.</p>
Keywords:	Honing, Surface roughness, Talysurf, Grain size, Feed, Wheel speed, Cylinder liner