

GENERAL MOTORS

Machinability of New Materials for Valve Guides

Motivation

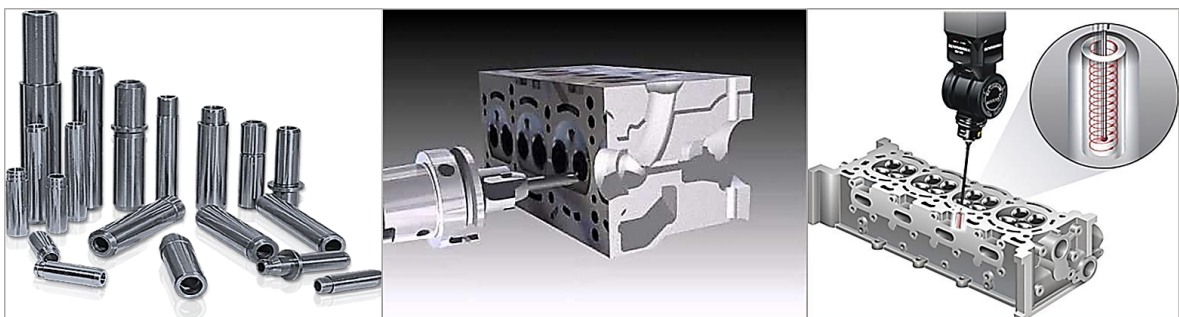
Automotive valve guides of high industrial production demonstrated premature wear in a specific region, during its useful life. This undue wear was classified as a failure generated by fatigue. This type of wear can be characterized by the formation of cracks and flaking caused by the repetitive and alternating sliding loading of the surfaces of the solids in relative motion. The mechanical properties of materials are directly related to fatigue wear, where one of the basic requirements of the material is to have sufficient hardness to resist the contact stresses that will be subjected.

Objective

Investigation of the machinability of new materials for valve guides with different surface treatment conditions

Approach

Machining of two materials of a ferrous alloy with heat treatment and two other materials of a ferrous alloy without heat treatment. Among the challenges encountered, the main ones were the development of a fixing device on the machine for the guides, parameterization of the machine and monitoring of the geometric tolerances of the materials during machining.



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