ANALYTICAL METHOD OF SOLVING THE STATE OF BALANCE FOR RECIPROCATING INERTIA FORCES IN V-ENGINES

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ABSTRACT

The aim of this paper is to elaborate an analytical method of solving the state of balance for reciprocating inertia forces in V-engines based on firing order. A formula to determine the resultant of reciprocating forces, based on firing order and angle between cylinder banks, was established. The formula allows to study the reciprocating force balancing for the every harmonic order, and does not require to know the disposition of the crankthrows. To appreciate the balancing state of a V-engine, through the balanced or unbalanced harmonics, considering the number of cylinders and the disposition of crankthrows of a bank an algorithm was established. The algorithm was applied to study the balancing state of reciprocating forces for an eight-cylinder four-stroke V-engine for two firing orders.

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