



FOR MARITIME TECHNOLOGY TRANSFER



DEVICE AND METHOD FOR DIAGNOSING THE INJECTION APPARATUS OF RECIPROCATING INTERNAL COMBUSTION ENGINES USING VIBRATION ACCELERATION SIGNAL SYMPTOMS

INNOVATIVE ASPECT OF THE INVENTION

Based on tested internal combustion engines, optimal sensor locations, sensor mounting directions, and useful diagnostic symptoms were selected. Measurements and valuable analyses of vibration acceleration signals in the time, amplitude, frequency, and time-frequency domains are performed. The selected diagnostic symptom relates to the determined limits and qualifies the tested injection subsystem to a fit or unfit state.

The presented method uses several diagnostic symptoms related to the features of the injection apparatus's technical state. In this method, the fields of the two-class scale for evaluating the technical state of the injection apparatus are established differently, where the symptoms of the technical state are tolerated based on the mean squared error of the arithmetic mean. The suitability state is between the upper and lower limits inclusive, and the state of unfitness is above and below the limits.

BENEFITS FOR THE INDUSTRY

The device and method will apply to the conditions of manufacture and operation of injection apparatus, both conventional and with electronic control of fuel injection, injection subsystems of compression-ignition internal combustion engines of transport, and stationary means of transport. The selected symptoms are closely correlated with the features of the technical state of the injection apparatus and show a very high sensitivity to changes in the technical state.

Identifying the state of unfitness will reduce fuel consumption, the emission of toxic components of exhaust gases into the atmosphere, and the engine's noise level

FOR WHOM?

The invention is directed to customers such as:

- internal combustion engine manufacturers
- shipowners
- shipyards
- companies performing maintenance of internal combustion engines
- transportation companies
- rail transportation
- power plants with internal combustion engines



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