

STUDY OF THE GAS-CONCRETE MECHANISM OF VOLTAGE COOLING VEHICLES

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The statistical theory of pattern recognition (STPR) is the scientific direction of technical cybernetics, which is engaged in the development of formal (mathematical) methods for recognizing objects of a statistical nature [1]. In solving the problem of diagnosing the gas distribution mechanism of an internal combustion engine (the engine's timing system), such objects are the classes of its technical condition.

The basic concepts of STPR:

- classes of the technical state in vector space, with geometrical interpretation of the structural parameters of the object of diagnosis, occupy certain compact areas;
- classes of the technical state defined in the vector space of structural parameters are mapped to the vector space of diagnostic parameters, in which certain compact areas also occupy;
- classes of technical state have a statistical nature and formally their position in the spaces of structural and diagnostic parameters is described by the laws of distribution of probability densities of the vector x .
- having a description of the statistical distributions of classes in the space of diagnostic signs, it is possible to build decisive classification rules on the basis of STPR methods, which, when diagnosing the timing of the engine, give optimal results.

The basis of the theory is the Bayes theorem, which determines the posteriori probability that the vector of diagnostic features belongs to the classes of its technical state.

Thus, to classify the technical condition of the timing of the internal combustion engine, it is necessary to have:

1. A priori probability of occurrence of a particular class of its technical condition.
2. A statistical description of the distribution density of each class in the space of diagnostic signs of its technical condition.

In the space of diagnostic signs, there can be only one reference class of the normal technical condition of the object and a multitude of classes that have certain violations.

References

1. Lavriyenko O. V. Diagnostics of the DVZ timing belt using methods of the statistical theory of pattern recognition: diss. – NTU "KhPI", 2016. P. 158-159.