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METHODS AND EXPEDIENT AUTOMATIC DIAGNOSTICS PROCESS OF MOTOR VEHICLES

ABSTRACT: Diagnostics imply procedures of defining condition and its cause, based on application of diagnostic means. Therefore, giving diagnosis means establishing of connection between vehicle and its breakdown and defining condition of vehicle, according to functions of criteria set in advance. During the diagnostic process, it is necessary to make a list of symptoms and list of breakdowns that may manifest through mentioned symptoms. It is necessary to define cause and effect relations between symptom and breakdown. Titles and ways of detection must also be precisely defined. When all of these activities are successfully completed, forming of diagnostic algorithms begin. If previously defined process of diagnostics is automated, then that is so-called automated diagnostic system. Application of diagnostic methods in order to define technical condition of motor vehicle is important, esp. in dynamic regime. For example, method of diagnostics of braking – according to curve, change in brake force on wheels, diagnostics of motor sus – according to indicator diagram, diagnostics of different mechanisms according to parameters of vibroacoustic process etc. Management of diagnostic equipment work is performed without participation of operator by in advanced given law, or that it is changed according to given law in function to weather or any other parameters. In controlled points of mobile system, values of giver's reactions are registered. Automatic control of important diagnostic parameters is done in comparing devices, by the principle "worse-normal-better", and results of comparing are given as standard signals. In logical devices, there is a logical process of giving diagnosis of technical condition of mobile system, with registration of results. Mathematical model of the diagnosed object is a group of analytical, logical, statistical, graphical and other connections that adequately connect output parameters of diagnostic objects, with input and inner parameters.

Most often used universal model of diagnostic objects are presented in the form of "black box", where input and output parameters have definite number of meanings.

Advantage of giving diagnosis analytically, by implementation of analytical models, is possibility to give concrete meaning to structured parameters, by which technical condition of objects is defined. In this way, it is possible to give diagnosis for several objects of diagnostics, analyze change in structured parameters in the function of crossed road or time, with possibility to predict technical condition of the object.

Process of giving diagnostics of the basic model for the diagnostic objects, as diagnostic stencils, consists of the following stages: Measurement and conversion, for establishing values of diagnostic parameters; Presenting values of diagnostic parameters in the system of Bull functions; Giving values to Bull functions of irregularity, where $X_i = 1$; $i = \{1, 2, \dots, m\}$ if we have i irregularity in the object.

In diagnostic stencils, there are given content description of all connections between structural and diagnostic parameters of objects (analytic functions, statistic dependence, logical connections, tables, graphics...) on a specific mathematic level as Bull function. Therefore,

it may be used as a universal diagnostic model of complex diagnostic objects. Visibility and relative simplicity of such a model simplifies the process of giving diagnosis.

Optimization of diagnostic parameters has theoretical and practical importance.

Criteria for optimization may be: Minimal amount of symptoms; Minimal diagnostic time; Minimal work while giving diagnosis; Maximum correctness of given diagnosis; Minimal average (total) time for technical maintenance and repair by using diagnostics.

KEYWORDS: vehicles, automatic diagnostics process

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