# Analysis Of Existing Methods and Means of Monitoring the Technical Condition of Motor Vehicles

**Sardor Khujamqulov**

Assistant, Fergana Polytechnic Institute, Fergana, Uzbekistan
E-mail: s.xujamqulov@ferpi.uz

ABSTRACT

Road transport is one of the important components of the forces for the successful development of the state economy. Road transport has not only economic but also strategic importance. This article discusses the analysis of existing methods and means of monitoring the technical condition of motor vehicles. A promising way to solve existing problems is to develop and implement a system that automates the collection and processing of diagnostic data. As a result, the content of the technical impact work performed on the diagnosed vehicle is recorded on the computer.

**Keywords:** Road transport, motor transport complex, reduction of transport costs, vehicle reliability, automation of the diagnostic process

## Introduction

Road transport, when performing its tasks, uses its qualities:

- the possibility of delivering cargo according to a specific schedule;
- transportation of goods at high speed; which reduces the demand for working capital and accelerates the turnover of capital;
- the possibility of supplying goods in small lots at the request of the consumer;
- speed of cargo transportation;

Improving the motor transport complex, and reducing transport costs create the basis for increasing competitiveness, in which, of course, the technical condition of cars must be in good condition [1-4].

The technical condition of the units and mechanisms of the car means its reliability, fuel economy, speed and driving safety are understandable [5-11].

## The main part

As a result of the long-term operation of cars, their quantitative indicators decrease and their properties change, as well as the technical condition of the car worsens, which causes a partial or complete loss of car reliability. The state of the reliability of the vehicle is understood as its operational performance, allowing it to perform the task assigned to it within a certain period. For the technical condition and reliability of the car to be at the required level, it is necessary to know the reasons for its changes and eliminate them in time [12-16]. The change in the technical condition of the vehicle occurs based on specific patterns, which are the change in the technical condition during the operation process (probability of the 1st kind) and the laws of random probabilistic processes (probability of the 2nd kind)).

The above patterns, in turn, are variations in the indicators of changes in the technical condition of the car during the operational period or the period of the road. These laws fully characterize the reliability of the car [17-21].

For the rational organization of the work of the fuel and chemical complex and diesel fuel, knowing how many separate types of “outages” can occur during a shift, day, week and month allow us to estimate the required number of workers, production area and the cost of spare

parts. The third is the interdependence of car reliability indicators [22-26].

According to the law, the recovery process is characterized by the occurrence of a "malfunction" within a certain period and its elimination. Comprehensive indicators of vehicle reliability include operation without damage (non-failure operation), long-term operation (durability), maintainability (maintenance) and maintainability (storability). Under the work without damage means the preservation of its technical condition for a certain period or distance travelled [27-31].

Long service life consists in maintaining the technical condition of vehicles until a certain time and performing TX, and JT work. Inspection repair propensity, TX and JT refer to the ease, ability and propensity to control and correct violations. Maintainability means that the vehicle can maintain its technical condition during periods of downtime or work. The most optimal solution for monitoring the technical condition of the car and its assessment is to carry out car diagnostics. Let's take a closer look at the diagnosis.

**Purpose and tasks of diagnostics**

The purpose of technical diagnostics is to determine the causes of the technical condition and malfunctions of the car with the least amount of time and effort and to give recommendations for maintenance and repair. The tasks of technical diagnostics are to maintain a high level of vehicle reliability characteristics, and reduce the cost of spare parts and operating materials for maintenance and current repairs. Ultimately, diagnostics are aimed at ensuring high technical availability of the car, increasing productivity and reducing transportation costs. Identification and prevention of breakdowns that occur during operation are one of the main conditions for maintaining the reliability and high efficiency of vehicles. Diagnostics is understood as a technological process of determining the technical condition of a car, its units and mechanisms without dividing them into parts and making a conclusion about the necessary maintenance and current repairs [32-34].

The diagnostic process is carried out according to external signs that provide information about the technical condition of the mechanism. At the same time, undetected malfunctions and breakdowns of the mechanism, the amount of necessary repair work to eliminate them, the future service life of the mechanism and a list of preventive maintenance to be performed are determined. Vehicle diagnostics is part of the maintenance and current repair processes at the enterprise. Timely identification and elimination of faults and the implementation of preventive measures reduce the rate of wear, increase the likelihood of trouble-free operation and reduce the amount of repair work [35-39]. Thus, the diagnostics allow us to quantify the serviceable operational and economical characteristics of the car and predict these characteristics within the limits of the residual resource or a given mileage. Further development of diagnostics depends on the improvement of car designs, the degree of automation of diagnostic systems and their specialization. The solution to the main issues of the development of car diagnostics is the development of diagnostic methods, tools, standard indicators and algorithms, the adoption of optimal technological and organizational principles for the use of diagnostics, and the collection of statistical materials to improve diagnostic processes, the economic efficiency of diagnostics depending on growth.

This is an improved form of diagnostic and control work at a new level. It differs from traditional control operations, firstly, in accuracy (accurate assessment of the technical condition of components, assemblies, and mechanisms), and secondly, in the ability to determine the parameters of their effectiveness (power, fuel consumption, the performance of brakes, gears, etc.), thirdly, the optimization of control procedures differ from the operational management of the technical condition of vehicles. Advances in diagnostics allow extensive automation of fault detection and diagnostics.

The economic efficiency of car diagnostics at automotive enterprises is as follows: the cost of current repairs is reduced by 8...12%, the cost

of spare parts is reduced by 10...12% and fuel consumption are reduced by 2...5%. %; and the distance travelled by cars will increase by 3...5%.

The costs of diagnostics are related to the performance management and adjustment of the vehicle and serve to ensure its high level of reliability.

Automation of the diagnostic process. In recent years, automated diagnostic systems (ADS) have been created: their information volume is about 80...100 parameters. The information flow from the diagnosed vehicle with the help of a variety of sensors goes to the operator, where the information is processed, and analyzed and a decision is made.

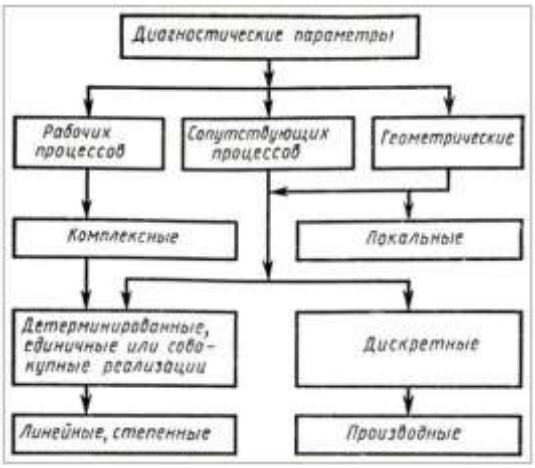


**Figure 1. Classification of diagnostic parameters**

The diagnostic process consists of two stages:

a) obtaining diagnostic information using sensors;
b) processing of information for the diagnostic conclusion.

The result of the timing of the work of the diagnostic posts showed the following: 60 ... 65 per cent of the time the car was at the diagnostic post was spent on auxiliary operations, processing and processing the results of the diagnosis. Of course, this inefficient use of diagnostic time creates several problems. A promising direction in solving these problems is the development and implementation of a system that automates the collection and processing of diagnostic information. As a result, the content of the work of the technical impact, performed on the diagnosed vehicle, is recorded on the computer [40-44]. ADT is a set of diagnostic tools for automatic assessment of the technical condition of a vehicle during maintenance and current repairs. ADT consists of:

a) recipient of diagnostic information from a diagnostic institution
b) a set of sensors;
c) convenient to receive signals from sensors and process them
d) production of modifiers;
e) evaluation of diagnostic information and the latter in the form of electrical signals
f) information processing devices that produce results;
g) Information devices that provide diagnostic results through the EU.

## Conclusion

It seems that when using an ADT, it is impossible to use sensors that provide continuous information (for example, brake diagrams or voltage waveforms). Information is obtained in a continuous (discrete) way, which to some extent limits the use of practical diagnostic and measuring instruments.

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