

Organization of the System of Centralized Diagnostics of Auto Vehicles According to Their Technical Condition

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Annotation: This article discusses the diagnosis of vehicles according to their technical condition.

Keywords: Organization, systems, diagnostics, car, technical condition.

Introduction: Currently, the role of road transport is increasing, and satisfaction in transportation largely depends on the technical condition of cars. In turn, it is difficult to increase the technical readiness of the vehicle fleet without a clear and reasonable organization of maintenance and repair.

Timely detection of malfunctions and their elimination by the forces and means of motor transport enterprises will significantly increase the technical speed of cars and increase their productivity without additional fuel consumption. However, late detection of malfunctions and unsatisfactory maintenance of cars entail not only significant material losses, but also an increased risk of road accidents.

Methods: Road transport is the most dangerous of all modes of transport. Statistics show that the danger when using cars significantly exceeds the danger of other modes of transport.

The main cause of road accidents is the unsatisfactory technical condition of cars. From 15 to 20% of road accidents are the result of technical malfunctions of rolling stock.

The inspection showed that due to the poor quality of control of mechanisms and components that determine traffic safety, 77% of cars with faulty brakes turned out to be on the line; 51% - with steering defects; 88% - with chassis malfunctions.

The main causes of technical malfunctions of cars include: poor quality and incomplete maintenance and repair of rolling stock; insufficient and unsystematic control of technical condition.

The results of numerous studies, the largest number of road accidents are due to brake system malfunctions.

Due to the imperfection of control works, which account for about 30% of maintenance, cars are often operated with undetected, and therefore unresolved, brake system malfunctions. This causes a high dispersion of the resource of aggregates, mechanisms and individual parts of the brakes of the car.

It should also be noted that the technical condition of the car is determined not only by the quality of its design and manufacture, but also by road, transport, atmospheric and climatic conditions, as well as the culture of operation and maintenance.

Depending on changes in the conditions and initial indicators of the car, its performance and mileage to the limit state vary widely. Therefore, improving the operational reliability of cars, reducing maintenance and repair costs, ensuring road safety is possible only with timely and objective determination of the technical condition of various components, assemblies and systems of the car by diagnosing them.

In relation to the tasks solved during the technical operation of rolling stock, diagnostics is understood as determining the technical condition of this mechanism or this system without disassembling them and forming a conclusion about the need for repair or prevention that can ensure the serviceability of the car within a given inter-control mileage, as well as managing the technological processes of car maintenance and repair.

With the introduction of diagnostics into the technological processes of maintenance, there is a reduction in costs for current repairs by 8-12%, a reduction in spare parts consumption by 10-12% and fuel consumption by 2-5%, as well as an increase in the technical readiness coefficient by 3-5%.

Technical diagnostics is a high-quality, more advanced system of control work. Its most characteristic positive features are the objectivity and reliability of assessing the technical condition of complex aggregates and mechanisms of the car, the ability to determine the parameters of their effectiveness, the availability of conditions for operational management of the technical condition of cars by optimizing control modes and identifying individual needs for repair and prevention.

The need to introduce technical diagnostics of cars into the practice of motor transport enterprises is due, on the one hand, to the desire to reduce material costs in the field of their technical operation, and on the other - the possibility of individual management of the technical condition of cars using diagnostic equipment.

Objective control of the technical condition of the rolling stock with the use of external diagnostic tools provides a joint solution to the problems of checking the serviceability of units, assemblies, vehicle systems and localization of detected malfunctions. Almost all external diagnostic tools are designed in order to compare with the relevant standards a fairly representative set of diagnostic parameters. They must ensure the determination of the location, nature of the malfunction and verification of its elimination by adjustments and labor-intensive replacements directly at the diagnostic post or stand.

External diagnostic tools at posts or lines are combined into complexes, the basis of which is roller, as a rule, power stands for checking aggregates, assemblies and various vehicle systems. The reliability of the diagnosis is very high and reaches 85-95%. However, currently only 20% of motor transport enterprises are equipped with diagnostic complexes. Most of the car fleet is operated without proper diagnostics.

Thus, diagnostics at the enterprises of motor transport is used simultaneously as a tool for troubleshooting and control by the personnel of the Quality control Department of the work performed and as a source of information about the condition of cars for centralized management and planning of the scope and nomenclature of maintenance and repair work, as well as production preparation.

In the future, diagnostics should become an information base for predicting the residual resource of cars, and will also allow for widespread automation of troubleshooting and diagnosis, which, combined with an increase in the controllability of promising cars, will make it possible, with minimal labor costs, to monitor their technical condition with high reliability.

The introduction of microprocessor control systems into the design of the car qualitatively changes it as an object of diagnosis and significantly complicates maintenance and repair. Effective and safe management of vehicle components and assemblies is possible only if both the system and the control object are technically sound, which implies the availability of diagnostic methods and technical means capable of detecting possible malfunctions in a timely manner.

Results and Discussion: On-board diagnostic tools ensure the maintenance of the vehicle in technically sound condition, reduce their downtime, the cost of maintenance and repair, allow more rational use of external diagnostic tools and working hours of drivers and repair workers. In the conditions of a significant complication of the design of modern cars, the role of the quality of adjustment work and maintenance increases, affecting the operational reliability of components and assemblies and traffic safety. An effective way to solve the problem of improving the quality of maintenance and repair, as well as the operational reliability of cars is to diagnose their technical condition. The specific complexity of diagnosing cars is relatively large, which is a consequence of both low controllability and imperfection of existing methods and tools.

All of the above problems can be solved by continuous monitoring of the technical condition of the car using on-board microprocessor diagnostic systems.

Conclusion: isable to create on-board diagnostic systems simultaneously with the development of microprocessor control systems, which allows using the same technical means to ensure the fulfillment of both control and vehicle diagnostics tasks.

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