Control of Technical Condition of Vehicles in Auto Transport Companies

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ABSTRACT

This article describes the development of methodological recommendations and the application of their results in production in order to improve during operation and ensure road safety of road transport.

KEYWORDS: car, maintenance, road safety, indicators, quantity, public transport, marketing research

INTRODUCTION

Due to the transition of the national economy to a market economy in our country, the situation in the transport market has changed radically. After the independence of our republic, this situation has completely changed, and the position of private cars in the transport market and the potential of services provided by them is growing day by day.

Similarly, in the transport market in Jizzakh, private transport is a priority in passenger transport. All 47 bus routes in the city are serviced by the private sector. However, the production technical base of the private sector providing these services is only close to 20%.

At the same time, the lack of pre-commissioning control in private vehicles often leads to their technical condition falling below the level of demand, which in turn has a negative impact on road safety. Therefore, the companies coordinating the activities of these vehicles should conduct regular maintenance of their vehicles and organize daily pre-commissioning inspections of their traffic safety mechanisms (steering, brakes, light and sound signals and the condition of the tires).

In our opinion, the following shortcomings in the activities of the private transport sector, which serves the population of the country, are due to the low quality of their services and the process of traffic on city streets:

- obsolescence of most vehicles;
- shortcomings in the organization of daily control over their technical condition;
- in some cases, does not operate in a fully organized manner;
- lack of skills and experience of drivers;
- weak control over the psycho-physiological state of drivers;
- the lack of interest of drivers to focus mainly on their own interests, to care about the creation of good conditions for customers;
- insufficient driving culture among drivers.

METHODS AND RESEARCH

The above cases and shortcomings, as well as other regions of the country, apply to the activities of private ATCs (Autotransportcompany) in Jizzakh region. Therefore, to increase the prestige of private transport services, to work to reduce the shortcomings to improve the quality of services provided to the population, to unite private transport owners in local communities, to provide them with legal protection, to improve the order and culture of transport services, coordination and centralization of transport services. The establishment of dispatching points for ordering transport services is an urgent task today.

It is required to study the mathematical laws of change of technical conditions in accordance with the requirements of
the manufacturer's instructions and the rules of technical operation of the manufacturer of the technical condition of vehicles involved in traffic.

The mathematical laws of change of technical condition of the car on the duration of work are studied. At the same time, it was found that with the increase in the operational efficiency of transport in enterprises, the cost of its maintenance will increase, the level of transport safety will be lost.

Predictions of changes in performance are given in Table 1 below.

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Table 1- Exploitation indicators prediction of changes

All maintenance work in ATCs provides high technical readiness of vehicles, but in all enterprises this work is not sufficiently organized. As a result, the chaos in the access of cars to the line and the operation of technically defective vehicles lead to various accidents.

For example, Sangzor Trans LLC in Jizzakh has 75 working cars, 10 of which are under control at the enterprise, and the rest have been leased. As a result, vehicles are being operated unsupervised. The company does not conduct technical and medical inspections, and the condition of vehicles is not monitored during operation.

In addition, TMS LLC conducts daily inspections according to the duties of the mechanic on duty before the cars enter the line, a medical examination is carried out. Information on daily medical control is recorded in the account, control on transport routes is constantly carried out, but the technological processes carried out do not fully meet the requirements of the REGULATION.

There are 70 serviceable vehicles at ATAC 2517 in Jizzakh, all of which are under the control of the enterprise, but the work on their technical condition and medical condition of drivers is not in accordance with the regulations. The company conducts technical inspections, but medical inspections are not carried out as usual, and the inspection of vehicles during operation is not in accordance with the regulations.

Before going to the line of № 11 cars belonging to the Marjanbulak gold concentrator in Gallaorol district, the duty mechanic conducts daily inspections and medical examinations. Information on daily medical control is recorded in the account, control on transport routes is constantly carried out, but the technological processes carried out at this enterprise do not fully meet the requirements of the REGULATION.

A similar situation can be observed in the ATCs of Samarkand region. Incomplete control over the technical condition of vehicles during operation leads to an increase in the number of accidents due to the impact of technical conditions.

The main part of the accidents was caused by brake control, failure of traction devices and cracking of the front wheel tires, and other cases related to the operational characteristics of vehicles were also observed.

The Republic of Uzbekistan is hot and dry. Mainly dry and cold conditions in winter conditions are exploited by cars.

When operating in cold climates, the mechanisms of the car, the aggregates have a negative impact on the mode of operation of the operating materials at the expense of cold. In cold conditions, a decrease in car productivity by 15-20% was observed. In cold conditions, the technical readiness of vehicles at the enterprise at and start-up (operation) coefficients, especially in the territory of the Marjanbulak gold concentrator G 11 in Gallaorol district dry 11 in the
operating conditions of dry cold -10-15°C in Russia -30-35°C. cold climate. The main reason for this is the problems with storage of cars in the open, and the violation of the reliability of the main mechanisms of the car, the delay in starting, overloading. According to statistics, drivers spend a lot of time starting the engines of № 11 cars belonging to the Marjanbulak gold concentrator in Gallaorol district, i.e., they are 30-40 minutes late. Under this condition, cars are delayed by 1-1.5 hours per minute, which leads to a loss of 21-30% of working time.

In turn, in cold conditions, it is difficult to start the engine at the expense of aggregate and operational materials, which reduces the reliability of cars, disrupts economy (increases fuel consumption), leads to disruption of the maintenance process.

When the engine is started in cold conditions, the preparation of the fuel mixture, the combustion of the mixture and the difficulty of rotation of the crankshaft occur. According to the norm, ndv is the frequency of rotation of the engine, nmin is the amount to be started.

Gasoline-powered engines are required to meet the ndv ≥ nmin requirement depending on the preparation of the fuel mixture. At this point it depends on the ambient air temperature. We can see the change in the coefficient of technical readiness of cars in the enterprise through the following graph.

Experimental research shows that the main problem in starting the engine, especially in cold conditions, is that the level of viscosity of the engine oil increases due to low temperatures on the surfaces of engine parts, leading to technical failure of the engine and premature maintenance.

Performance characteristics of vehicles are determined by the skill of the driver involved in the safe movement of the traffic flow, the condition of the road, the environment and other influencing factors.

Changes in the main operational characteristics of the car play a special role in ensuring safe driving, traction dynamics, braking, handling and information exchange. These indicators are complex:

- Traction dynamics - the time of acceleration at a certain limit speed, depending on the type and capacity of the car engine;
- brake feature-braking distance, time and amount of deceleration;
- steering - free control of the steering wheel and power control when turning;
- stability-critical velocity limit;
- information transmission is assessed by the degree and distance of collection of colors and sounds.

During operation, the initial values of these parameters decrease, which leads to a violation of the structure of the process of technical condition of cars.

We are well aware that the structure of each object is described as follows:

- The location of the structure of the elements (details), the parts that make up the object;
- size and shape of the structure of the elements;
- types of resistance to each other in terms of elemental composition.

According to the statistics of the Traffic Police of the Interior Ministry of Jizzakh region in 2011-2017, as shown in Table 2, the most common causes of traffic accidents are defects in the control parts (brake and steering) during the operation of vehicles.

- Defective parts:
  - Brakesystem
  - Steeringwheel
  - Tires (treadwear, cracking)
  - Wheels
  - Sound signal and lighting devices
  - Connecting devices
  - Other parts

According to our observations, shortcomings in the organization of the control and diagnostic process, poor technical condition of vehicles lead to the loss of safe movement. This shows that the use of diagnostic tools and priority methods by ATC technicians in the production process is of great importance in improving the technical condition of vehicles on the line to ensure road safety.
At present, the spiritual and physical deterioration of vehicles in ATCs has a significant impact on the process of traffic on the roads.

Obsolescence of construction and operational materials, loss of their physical and chemical properties, the temperature of the external environment affect the change in the technical condition of cars. First of all, rubber technical products (tires, chambers, gaskets, cuffs, sealants), as well as working fluids in the car's hydraulic booster and oil materials are subject to more changes.

Changes in the physicochemical properties of the operating materials and temperature violations of the elements in the aggregates, mechanisms and systems of the vehicle account for about 12% of the total failure.

Faults due to changes in the composition, shape and size of the elements during the operation of vehicles are as follows: shaft failure; wear of brake drums; reduction of transverse shears; resorption of fingers; loss of cohesiveness of turning screws and other details; expansion of the gap between the engine cylinder mirror and the piston rings; loosening of the steering hinge; loosening of all fasteners in the vehicle.

The technical condition of vehicles is assessed in accordance with the level of classification of aggregates and mechanisms of the average value of the composition of the main indicators, i.e. their reliability, serviceability and safe operation.

During the operation of the car, the technical condition of some units and systems changes, and the breakdown of some parts and units leads to a malfunction. This, in turn, has an impact on the decline in vehicle performance.

We are well aware that the operational characteristics of the car include the following indicators:

1. Traction dynamics of the car - Faults in the engine mechanisms and systems lead to a decrease in power. Loss of traction and speed characteristics of the car as a result of the breakdown of engine units and parts indicates a 15-20% reduction in power. Defects caused by wear and friction of chassis parts can also lead to uneven movement, loss of control, and increased resistance.

   Violation of the technical condition of the car leads to a 20-25% reduction in maximum speed, and 25-30% prolongs the way and time of acceleration, as well as complicates traffic safety, such movement of cars leads to accidents on the roads during operation.

2. Braking dynamics of the car - Negative braking can be observed in the following elements of the vehicle: wear and lubrication of the brake lining, failure of the brake system due to compressor failure, loss of pipe integrity, failure of the brake valve and pressure regulator.

   Even a very small malfunction can pose a great risk during movement. For example, an increase of 0.5 mm between the brake drum and the lining will result in a 2.5-fold increase in the braking distance.

   As a result of lubrication of the friction coating, the braking distance increases by 4-5 times.

Scientific sources also reveal many causes of traffic accidents due to brake system failure.

It was found that 50% of accidents are caused by failure of the car brake system, failure, technical failure.

3. The stagnation of the car is proved in the educational literature with such cases as loss of control of cars on the roads, loss of gear ratio, slippage, lateral sliding and overturning.

   Loss of vehicle stability can lead to a serious traffic accident.

4. Vehicle steering - Defects in steering cause loss of steering direction. Faulty steering is a major cause of serious traffic accidents.

   The technical condition of cars in ATCs depends on their operational characteristics, the quality management of vehicles technical maintains and repair is of great importance.

Preparation of vehicles for safe movement in the ATC is carried out as follows:

In ATC, control and monitoring work to prepare vehicles for the line is carried out mainly on the state of units, parts and systems that affect traffic safety. This process is mainly performed in a complex manner during the 1st diagnosis. With the help of Diagnostic 1 in the ATC, the work of technical maintains and repair is carried out to ensure traffic safety, to prevent defects in the parts that cause traffic accidents and cause breakdowns of vehicles.

From this point of view, in our opinion, it is expedient to carry out high-quality diagnostic work in ATCs, car services during the annual technical inspection. The diagnostic equipment currently in use is mainly available at large car repair shops located in city centers.

The system of technical control at public and private auto transport companies in foreign countries.

In European countries, for example: in Germany, the passenger service is owned by the city government, and transportation is carried out according to plan.

Rail transport is often used for urban and long-distance passenger transport. In order to ensure the environmental safety of vehicles, electric motors are used instead of IODs.

The management system in the ATC is a joint-stock company, the proceeds of which are used to stabilize the environment and update the structure of the movement.

Buses are only used to transport passengers around the city. The management system of the ATC operates in the following order:

   The manager is the head of the enterprise and organizes the services of all types of engineers in the enterprise.

The structure of the joint-stock company includes small associations. In associations, the work process is based on customer demand, and the management system is based on state law.

There are 19 federal districts in Germany, and road safety is the responsibility of the district police. There is no single
State road safety service, which is connected to an interconnected information system for the issuance of driver’s licenses, registration and deregistration of vehicles. The owner of the purchased vehicle can register in any county and deregister in another.

In France, there are three types of services simultaneously with the organization and safety of traffic on the road network: the specialized traffic safety service in Paris; on long-distance roads — the National Guard and the local gendarmerie. All three services have interconnected information systems.

In the U.S., despite the efforts of the federal traffic safety services, every state has a traffic rule approved by the governor.

Explanatory work and retraining in all ATCs in accordance with these traffic rules are carried out in the required order. In European countries, ATCs consist of private associations and operate in the order of attachment to a joint stock company. In European countries, taxi associations are engaged in passenger transportation within the city. Private associations act in accordance with the law, based on the state political system. The management system of a private association includes an association manager, an environmental engineer, an operation engineer, a traffic safety engineer, and mechanics.

Private associations have a dispatch service, communication management system. Conditions of vehicles and drivers are checked before the exit to the line during driving time. Basically, a lot of attention is paid to the work plan of drivers, their movements on the line, flights, flight intervals. Medical personnel also have full control of the drivers. Work shifts are performed at specific times. At a private transport company, maintenance work on the technical condition of vehicles is carried out mainly in service centers. Although HATK has its own production building and production base, but maintenance work is performed only in car services. This is because the automotive companies enter into contracts with car services to carry out branded maintenance of their cars. Only inspections are carried out at the auto transport companies, i.e., the technical condition of vehicles and the medical condition of drivers are monitored on a daily basis.

The formation and expansion of transport services in ATCs in a market economy is associated with the following issues:

- creation of a healthy competitive environment, strengthening control over the activities of monopolies, increasing the role and responsibility of monopolies;
- protection of the interests of consumers of transport services and businessmen engaged in transport services, providing them with all possible assistance;
- introduce the procedure and rules for permitting vehicles belonging to individuals or legal entities, regardless of the form of ownership, when it is necessary or necessary to use public bus routes;
- creation of conditions for interaction, assistance and cooperation of joint-stock companies of private passenger carriers and urban passenger transport;
- organization of marketing research in the field of the state, prospects, prospects, demand and supply of the transport services market;
- prevention of pollution of vehicles by the environment, development of legal and regulatory documents, regulations for this process and ensuring strict compliance with them;
- consistent study of the technical condition of vehicles, paying great attention to the profession and specialization of drivers and transport personnel;
- condition of production and technical base of vehicles, enterprises, car parks, raising the level of business activity to the level of transport complexes of developed countries, i.e., selection of passenger routes, competitions or tenders that meet international standards in the field of accommodation, these requirements are equally responsible for all forms of transport provide. Such activities have led those who own private passenger transport to form their own society or association.

Efficient use of vehicles, raising the level of service culture, providing them with high-speed communications, navigation equipment, improving the dispatching service requires work with foreign companies in this area. Of course, given the incomparable importance of urban passenger transport in the production and vital activities of the urban population, its consistent development, the state provides great assistance and support in the renovation of car parks.

Also, in the CIS, as in foreign ATCs, the system of governance is controlled by state law enforcement agencies.

The basic objective of the research is to develop the long-range planning of a company that transports passengers. Long-range planning of the company's future activities over the next five years will make it possible to draw up the long-range production plan, the long-range human resources plan, the long-range cash flow plan, the long-range tax plan, the long-range marketing plan and the long-range customer service plan.

Until 1998, the inspection of the technical condition of vehicles was carried out in almost all CIS countries under almost the same regime. During this inspection, all the work specified in the regulations was carried out in the TCC and JT with the help of technological equipment. The following instructions are an example of this.

The Decree of the President of the Russian Federation of June 15, 1998 "Additional measures to ensure road safety" states that the purpose of monitoring the technical condition of autotransport companies is twofold:

The first direction is to develop measures in cooperation with the ODIHR in accordance with the regulations on other safety standards for the design of vehicles in organizations and private activities, and to monitor the implementation of these measures by all enterprises and organizations. The control pays attention to all the elements, i.e., the technical condition of buildings and structures and construction documents, the availability of conditions for testing new cars in accordance with international standards, the requirements for the maintenance of modern cars.

The second direction is to control the technical condition of vehicles during operation. Checking the status of compliance with this process in all enterprises and organizations.
When inspecting the technical condition and design of a vehicle during its operation, the following should be taken into account:

- checking of documents;
- check the compliance with the requirements for the technical condition and design of vehicles, regulations;
- compilation of control results.

The technical condition and construction control of vehicles during operation are checked on the basis of a number of documents, determined on the basis of regulatory factors:

- movement of employees of the department of state traffic safety in accordance with the established procedure for the registration of vehicles in accordance with the established procedure for work in production;
- on state technical inspection - state technical inspection by the staff of the Ministry of Internal Affairs of the government;
- on the basis of the procedure established by the traffic police in the government for traffic control.

Inspection of vehicles is carried out on the basis of the requirements for the design, make, model, modification, color, year of manufacture, chassis and body number (frame) and engine of the vehicle, their registration documents.

During the inspection, special attention is paid to the parts of the vehicle (body type, engine, special non-removable equipment, number of seats, chassis) and checked for the following regulatory requirements:

- appearance of vehicles;
- inscriptions and signs on the appearance of vehicles;
- special color and sound signaling equipment installed in vehicles;
- Radio-electric equipment in vehicles.

If there are changes in the design of vehicles that affect the traffic process, the operation of vehicles will not be allowed by traffic police and will be subject to financial liability.

If the forged documents on the vehicles do not correspond to the design of the vehicles, a request is sent to the State Administrative Administration of Uzbekistan and the MIA to clarify, and if the document is illegal, administrative action is taken.

The use of technical diagnostic tools in the inspection of the technical condition of vehicles increases the accuracy of the technical condition.

The use of technical diagnostics of vehicles is allowed only if there is a document on the technical condition of vehicles, a certificate confirming the modified type of vehicle, documents confirming the inclusion of the modified type of vehicle in the state register.

The technical condition of vehicles and the results of construction inspections are recorded in the following order established by the Russian Interior Ministry:

- Rules of procedure for the state technical inspection of vehicles;
- traffic control-on the work of the traffic patrol service of the State Traffic Safety Inspectorate of the Ministry of Internal Affairs of the government.

During the movement on the roads to monitor the technical condition of vehicles, the observation process is carried out at a stationary post, road patrol service checkpoint, vehicle checkpoint, as well as at the checkpoint of the state technical inspection of vehicles (except for areas with limited visibility, before turning or turning) then, before or after the crossing, before the intersection is mainly prohibited in courtyard areas, railway crossing area, parking lots or stations). Control over the technical condition of moving passenger vehicles is carried out in the prescribed manner at the last station, bus station and parking lots. At the station, mainly during the control of the technical condition of vehicles during traffic, the following is determined:

- Lack of rear-view mirror in the lower corner of the moving car;
- non-standard seats are installed on vehicles;
- the presence of faulty vehicles.

If there are defects in the driver’s documents or if the document is not at all and there are defects in the control mechanisms, traction devices, according to the law of the government, the vehicle is stopped and sent to a special storage facility.

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CONCLUSION

In conclusion, it should be noted that mainly:

- The system of control over the technical condition of vehicles in the ATC, the shortcomings of the existing system, the reasons were studied.
- The existing system of control over the technical condition of vehicles in ATCs was studied. Theoretical solutions for assessing the level of technical condition of cars in their enterprises using a mathematical model were proposed. This was mainly based on the theoretical values of the coefficients of technical operation and technical readiness of vehicles on the periodicity of maintenance.
- Data on the operation of technical control and its management system in foreign transport enterprises and the effectiveness of the use of vehicles were analyzed.
- The types of technical means required for technical inspection, work performed and operating procedures were studied in the ATCs. It is recommended to control the technical condition of vehicles, ie brakes, steering, tires, equipment, keys and equipment used in diagnostics, which affect traffic safety.

REFERENCES


