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METHODS OF CREATING NOISE PROTECTION AND INFLUENCING FACTORS ON CAR NOISE IN SHAROF RASHIDOV AVENUE OF JIZZAKH CITY

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ABSTRACT

This article examines the influencing factors on car noise in Sharof Rashidov Avenue of Jizzakh city, according to which the analysis of the causes of noise in car engine, transmission noise, aerodynamic noise and tire noise in the structure itself as sources of noise done. The speed, intensity and noise of the braking areas on the road were also found to have a significant impact on the overall traffic noise of Shah Street. The most effective way to protect traffic noise is to extinguish it at the source of the noise. Noise problems can be solved by creating an alternative to car noise sources, engine, noise suppressor, transmission and other factors. It can also be achieved by optimizing the movement of cars in the traffic flow to eliminate noise by organizing traffics on highways.

Keywords*: car, noise, street, traffic safety, noise sources, traffic speed, traffic speed, congestion, noise protection, traffic noise, engine noise, aerodynamic noise, noise reduction.*

АННОТАЦИЯ

В данной статье рассмотрены факторы, влияющие на автомобильный шум на проспекте Шарофа Рашидова города Джизак, согласно которым проведен анализ причин возникновения шума двигателя автомобиля, шума трансмиссии, аэродинамического шума и шума шин в самой конструкции как источников шума. Было также установлено, что скорость, интенсивность и шум тормозных зон на дороге оказывают значительное влияние на общий шум движения на улице Шах. Наиболее эффективным способом защиты от дорожного шума является его гашение в месте источника шума. Проблемы с шумом можно решить, создав альтернативу автомобильным источникам шума, двигателю, шумоглушителю, трансмиссии и другим факторам. Этого также можно достичь за счет оптимизации движения автомобилей в транспортном потоке для устранения шума за счет организации движения на автомагистралях.

Ключевые слова: *автомобиль, шум, улица, безопасность движения, источники шума, скорость движения, скорость движения, затор, шумозащита, шум движения, шум двигателя, аэродинамический шум, шумоподавление.*

INTRODUCTION

There is a wide range of researches being done by scientists today to reduce the negative impact on the operation of vehicles, and users of this vehicle will definitely choose and buy the most comfortable, safe, economical car. In the Republic of Uzbekistan, the automotive industry is developing day by day, making great efforts and investments in the production of competitive products. In particular, the adoption of the Resolution of the President of the Republic of Uzbekistan dated July 18, 2019 No PO-4397 "On measures to accelerate the development of the automotive industry of the Republic of Uzbekistan" [1] also aims to develop the automotive industry steps to ensure the rapid development of the automotive industry and increase its investment attractiveness, the introduction of modern market mechanisms and management methods based on best international practices, as well as the production of competitive car brands in domestic and foreign markets.

By the end of 2022, it is planned to implement three projects cost $ 277 million in the automotive industry in Jizzakh region. In the first phase, ADM Jizzakh will produce cars, in the second phase Jizzakh Automobile Factory will produce Volkswagen commercial vehicles, and in the third phase Auto Motors Asia will produce commercial and truck cars. Established in partnership with foreign countries, the products of this automobile plant are of high quality, economy and, most importantly, safety. These cars are also manufactured in accordance with the latest environmental standards.

As mentioned above, the car generates many negative effects during operation, including traffic noise, which has a slow but very serious impact on the human body, and is one of the most pressing issues that need to be addressed today.

External and internal noise from cars poses a serious threat not only to road users - drivers, passengers and pedestrians, but also to people living in areas adjacent to the road [5].

DISCUSSION AND RESULTS

Noise control is now one of the most pressing issues. Studies show that people who have been exposed to excessive noise for a long time suffer from central nervous system disorders. They experience wakefulness, irritability, fatigue, and headaches.

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High levels of noise can cause serious illnesses, such as nervous system stress, cardiovascular disease, and hearing loss. Studies have shown that at 88 dB of noise (in the bus cab) the driver's thinking ability is reduced by 10%, and at 95 dB by 20% [2].

Noise sources primarily transmit strong noise to the interior of the car. As mentioned above, noise can reduce a driver's attention span and lead to fatigue and exhaustion. Decreased attention span, fatigue, and, in many cases, drowsiness while driving can lead to serious road traffic accidents [7].

During the movement of the car on the road and during the operation of its engine, a strong noise is generated and spread to the environment. The amount of noise from cars is constantly increasing as it moves on the roads. In the work of a number of Uzbek and foreign scientists on the reduction of car noise, its protection and anti-noise measures, including O. Qudratov - strong sharp and long-lasting noise can have extremely negative consequences for the human body. conducted scientific research on the subject and proposed appropriate conclusions in this regard. Foreign scientists VF Babkov, LE Biryukov, VI Chudnov, VN Lukanin, IV Alekseev have conducted a lot of research and scientific research on the sources of car noise, their amplification factors, the development of measures to reduce and combat traffic noise.

The increase in vehicle noise during operation is due to the fact that highways are the main sources of noise in the traffic flow - car engine noise, transmission noise, aerodynamic noise and tire noise [6].

In the engine, noise is generated during the compression and expansion cycles in the cylinders, which in turn causes the engine to vibrate, causing noise [8]. The amount of noise in the engine depends on its operating capacity, speed and power. Noise in the supply system is caused by the opening and closing of the inlet and outlet valves, the intensity of which depends on the engine operation, speed and type of air filter. The noise of fans, generators and pumps in the cooling system further enhances the noise of the engine. Noise in car transmissions is mainly caused by friction between gears and friction transmissions (Figure 1).

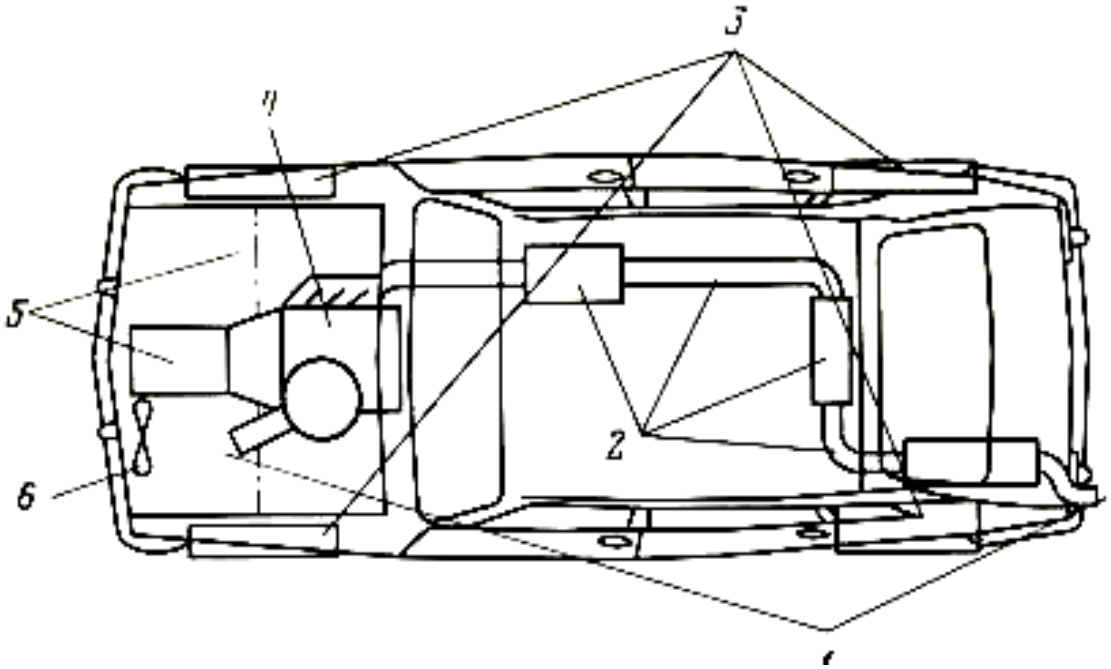


Figure 1. Sources of noise in the design of the car
1-engine air intake and exhaust vents;
2-noise extinguisher;
3-wheels;
4-engine;
5-transmission;
6-fan.

The noise generated in the structure increases during the movement of the vehicle, which is greatly affected by the speed of the vehicle and the speed of movement on the road [11] (Figure 2).

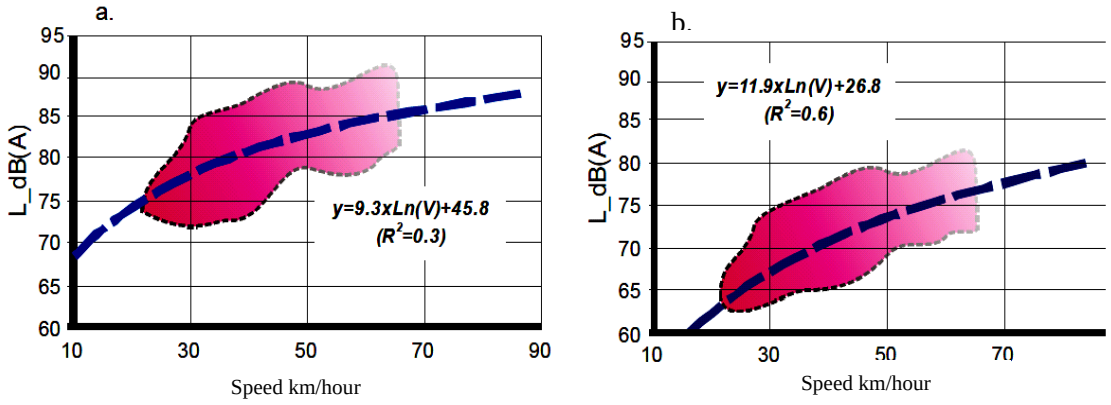


Figure 2. Influence of speed of trucks (a) and cars (b) on noise (when the noise level is determined at a distance of 10 m)

At the same time, the presence of high-powered and heavy-duty trucks in the flow of traffic also increases the noise level.

Noise measurement tests are carried out in accordance with international standards, in which the noise levels of the noise-producing parts of the car are integrated - the internal and external noise of the car. The normal operation of the engine and the normal operation of other units can also be determined from the amount of noise obtained from the test results.

Traffic noise is mainly observed on highways in densely populated urban areas, which is due to the growing number of cars, which in turn is due to the congestion of city streets. Noise levels will be measured on existing highways in the city. The tests are mainly performed on high-noise roads.

GOST ISO 362-1-2017 “Measurement of noise emitted by cars during acceleration. Technical method. Part 1 According to the standard "M and N category vehicles" [1] conducted research by specialists of the Department of "Vehicle Engineering" of Jizzakh Polytechnic Institute. Noise was measured using a Sound Analyzer Nor-140 meter

During the study, Sh. The high-noise section of Rashidov Avenue and the main factors influencing this noise level were studied.

Based on the test results, the following was identified:

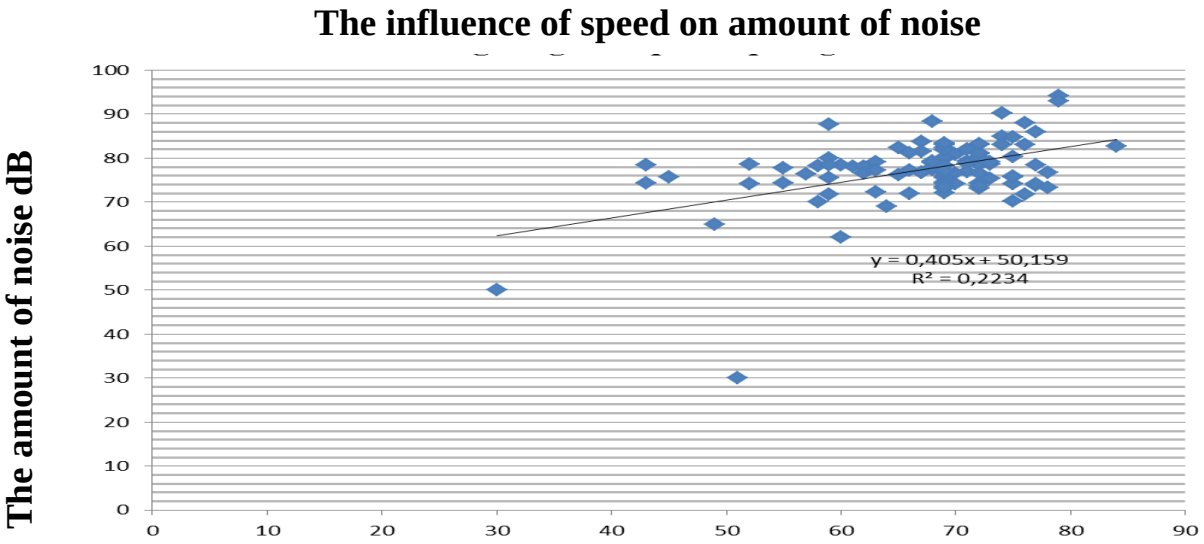
- Sh. At the intersection of Rashidov Avenue and Shifokorlar, Alisher Navoi and Islam Karimov Streets, the noise level was found to be 88-96 dB due to high traffic congestion, constant use of sound signals by drivers and braking and acceleration;

- It was found that most of the cars with a noise level of 84-89 dB in the traffic were old models (Jiguli (VAZ), Moskvich) and technically defective;

- The effect of the speed and intensity of traffic on the highway on the noise level was analyzed (Figure 3);

- The level of noise in regulated and unregulated pedestrian crossings on this street will reach a maximum of 93.6 dB due to braking and acceleration (tire noise).

[1] GOST ISO 362-1-2017 Measurement of noise emitted by motor vehicles during acceleration. technical method. Part 1. Vehicles of categories M and N (https://files.stroyinf.ru/Data/719/71994.pdf)



Sanitary norms "SanPiN RUzN 0267-09" "Sanitary norms and rules of permissible noise in residential buildings"[2] are applied in the territory of the Republic and according to this standard the average noise level in residential areas is 45-50 dB. In particular, the noise level for educational institutions, medical facilities, resorts are 35-40 dB.

Sh. Given the location of schools, clinics, recreation centers, institute buildings and shops in the areas adjacent to Rashidov Avenue, noise protection is one of the most important tasks in this area.

Measures to reduce and combat noise in the car, mainly to eliminate noise at its source, as well as to cover the noisy car parts with sound-absorbing materials are proposed. In addition, spraying sealants and anti-noise sealants on the inner surfaces of metal bodies using a straightener or pneumatic spraying device to reduce the noise when the car is moving [2].

Extinguishing the noise from the car is done by its design and organization of traffic. Noise can be reduced by noise suppression in the structure itself, coating of insulating materials on noisy parts and body (Figure 5) and creation and improvement of modern designs of noise sources in the structure.

[2] SANITARY NORMS AND RULES for ensuring permissible noise in the premises of residential, public buildings and on the territory of residential development SanPiN RUz N 0267-09

Figure 4. Covering the corpus of car with isolation materials.

One of the most effective solutions to organize noise protection on highways and eliminate it in road conditions is noise barriers. Road noise screens are the most effective noise suppression barriers in road conditions, they have different designs and their installation is based on special acoustic requirements.

CONCLUSION

The most effective measure in the organization of traffic noise protection is to extinguish the noise at the noise sources themselves. Noise problems can be solved by creating an alternative to car noise sources, engine, noise suppressor, transmission and other factors. This can be achieved by covering electric vehicles, car bodies with

noise-absorbing materials, and improving the engine combustion process. In addition, the organization of traffic on highways can be achieved by optimizing the movement of vehicles in the flow of traffic to reduce noise. is one of the sensible solutions. In addition, noise-absorbing and noise-reducing devices, the creation of structures gives effective results.

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