EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)
ISSN2660-9630
www.ejlss.indexedresearch.org Volume 29, May-2023 ||

Determination of the Consumption of Spare Parts for Components and Systems of Vehicles During the Period of Operation

Karimov Islomjon Toxirjon o‘g‘li
Assistant of the “Automotive and automobile industry” department, Tashkent State Transport University, Tashkent, Republic of Uzbekistan

Vasik Ulashevich Jovliyev
Senior teacher of the “Automotive and automotive industry” department, Tashkent State Transport University, Tashkent, Republic of Uzbekistan

Otaqo‘ziyev Doniyor Inomjon-o‘g‘li
Assistant of the “Department of automotive and production engineering” department, Tashkent State Transport University, Tashkent, Republic of Uzbekistan

Abstract: *In the period of market relations, the reliability of vehicles operating in transport processes and their costs are of particular importance. They depend not only on the quality of the cars, but also on their performance and handling. During operation, changes occur in the technical condition of the vehicle and its aggregates and systems, which leads to partial or complete loss of performance.*

Keywords: *operation, car, means, bus, subway, resource, transport.*

Date of Submission: 29-04-2023 ***Date of Acceptance: 31-05-2023***

Providing auto parts with the necessary spare parts increases vehicle uptime and reduces unnecessary downtime. One of the main criteria in managing the reliability of vehicles in terms of aggregates and systems during operation is the comparative costs for spare parts [1].

As the reliability of cars decreases (breakdowns and malfunctions increase), the need for spare parts increases. In addition, the demand for spare parts depends on the distance traveled by the cars since their use, and as this distance increases, the nomenclature of spare parts also increases. Therefore, it is necessary to collect and process information during operation to determine the reliability characteristics of cars. In this case, it is necessary to characterize the observed indicators sufficiently and accurately.

Statistical information values obtained in the management of the reliability of the aggregate or system in question are determined by intervals. In this case, the comparative costs of spare parts are determined as follows:

$$C_{Ýêi}(L) = \sum_{j=1}^{K} \omega_{i,j}(L) \cdot C_j$$

Here $\omega i_{,j}(L)-$ j of the named detail i - parameter of flow of disruptions by span, disruption/item thousand km; K - the nomenclature of replaced parts by unit or system; C_j- j the price of the named detail, sum.

The parameter of the breakdown flow of parts is determined as follows:

$$\omega_{i,j}(L)=\frac{m_{i,j}(L)}{N_0\cdot\Delta L}$$

N_0 –the number of cars under surveillance; $m_{i,j}(L)$ – j of the named detail i - number of violations per interval.

An example. Cars in intervals and the price of each detail, the number of breakdowns and the value of the interval in thousand km. (Table 1) is presented.

Table 1 Parts that are replaced by aggregates or systems of cars during operation

№	Details		Distances, thousand km									
	name	price, sum	0 20	20 40	40 60	60 80	80 100	100 120	120 140	140 160	160 180	180 200
1	1st	65000	0	1	2	3	2	3	4	4	3	4
2	2nd	135000	1	2	2	3	2	4	3	4	5	5
3	3rd	200000	1	2	3	4	3	5	6	5	4	5
4	4th	300000	0	1	1	2	2	3	3	2	4	4
	Number of cars		25	25	25	25	25	25	25	25	24	23

The comparative cost of spare parts for each nomenclature detail is shown in Table 2.

Table 2 Calculation of comparative costs of spare parts (sum/thousand km) according to the details of each nomenclature

т/р	Details name		Distances, thousand km									
			0 20	20 40	40 60	60 80	80 100	100 120	120 140	140 160	160 180	180 200
1	1st		0,0	130,0	260,0	390,0	260,0	390,0	520,0	520,0	406,3	565,2
2	2nd		270,0	540,0	540,0	810,0	540,0	1080,0	810,0	1080,0	1406,3	1467,4
3	3rd		400,0	800,0	1200,0	1600,0	1200,0	2000,0	2400,0	2000,0	1666,7	2173,9
4	4th		0,0	600,0	600,0	1200,0	1200,0	1800,0	1800,0	1200,0	2500,0	2608,7
	Total	test	670,0	2070,0	2600,0	4000,0	3200,0	5270,0	5530,0	4800,0	5979,2	6815,2
		theoretical	776,12	1749,83	2553,67	3275,67	3945,18	4576,75	5178,99	5757,51	6316,25	6858,11

According to the results of table 2, the graph of the change of the comparative costs of spare parts by distance (Fig. 1) is presented. In this, the spare parts are graded to determine the theoretical value of the comparative cost $C_{\acute{Y}\hat{E}}^{\acute{I}}=bL^n$ expression is selected. In this expression b a random variable, an angle characterizing the speed of the indicator, n is the degree coefficient. The least squares method was used to determine the values of these coefficients [2]. As a result, the following

coordinate passes through the origin ($L=0$ at $C_{\acute{Y}\hat{E}}^{\acute{I}}=0$) level expression is determined $C_{\acute{Y}\hat{E}}^{\acute{I}}=141{,}23L^{0{,}74}$.

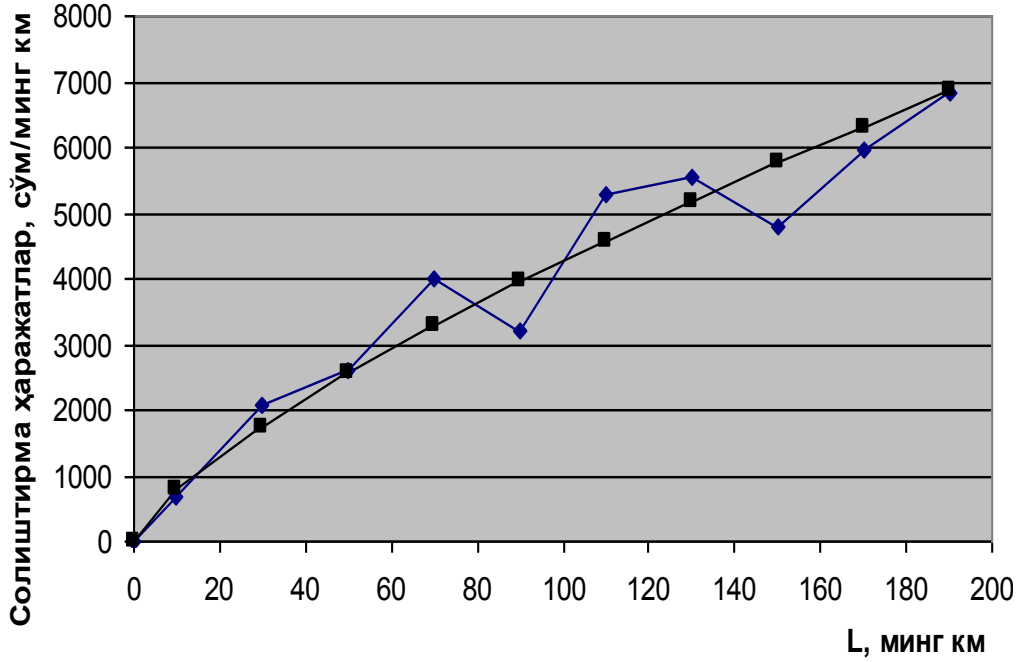

Figure 1. Variation of the relative cost of spare parts by distance. According to the result of the 1st test; 2- theoretical.

On the basis of the received data, in the process of operation, on aggregates and systems of cars:

- the most alternative resources:
- reliability management;
- Allows you to develop reasonable proposals for maintenance and repair work.

References:

1. Reliability theory and diagnostic basics: Textbook for bachelors of higher educational institutions. ./A.A. Tojiboyev, Q.M. Sidiqnasarov, K.I. Ibrohimov, N.V. Kusnetsov, T.: “Extremum-Press” 2015. 296 b.
2. E. Mamurov, T. Adirov. Probability theory and mathematical statistics. Study guide. Tashkent Institute of Finance, 2005. 152 p.
3. Sh.P. Magdiyev "Technical operation and service of automobiles" Tashkent, 2021.
4. Riskulov, Alimjon Akhmadjanovich, and Murodjon Iskandarovich Rakhmatov. "MAINTENANCE AND REPAIR OF CAR CARDAN SHAFT." CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES 3.12 (2022): 342-345.
5. Rakhmatov M. I., Zayniddinovich S. Z., Tuygunovich B. M. Methods of Maintenance of Automobile Transport Engines //Nexus: Journal of Advances Studies of Engineering Science. – 2022. – Т. 1. – №. 4. – С. 90-92.

6. Rakhmatov M. I., Zayniddinovich S. Z., Tuygunovich B. M. Analysis of Cardan Shaft Defects and Ways to Restore Them //Vital Annex: International Journal of Novel Research in Advanced Sciences. – 2022. – Т. 1. – №. 3. – С. 135-137.
7. Riskulov A. A., Rakhmatov M.I., Avliyokulov J.S. To Determine the Bending Stiffness of Stand Cardan Shafts, Splined Joints of Construction and Road Vehicles //Nexus: Journal of Advances Studies of Engineering Science. – 2022. – Т. 1. – №. 3. – С. 40-44.
8. Riskulov, A. A., J. S. Avliyokulov, and M. I. Rakhmatov. "REALIZATION OF THE PHENOMENON OF NANOSTAGION OF INDUSTRIAL THERMOPLASTICS." Bulletin of Science and Education,(12-1 (115)) (2021): 38-40.
9. Riskulov, Alimjon Akhmadjanovich, and Murodjon Iskandarovich Rakhmatov. "MAINTENANCE AND REPAIR OF CAR CARDAN SHAFT." CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES 3.12 (2022): 342-345.
10. Rakhmatov, M. I., Zayniddinovich, S. Z., & Tuygunovich, B. M. (2023). Maintenance and Repair of the Steering Mechanisms of the Car. CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES, 4(2), 108-112.
11. Rakhmatov, Murodjon Iskandarovich, Sharopov Zavqiddin Zayniddinovich, and Boliyev Mansur Tuygunovich. "Methods of Maintenance of Automobile Transport Engines." Nexus: Journal of Advances Studies of Engineering Science 1.4 (2022): 90-92.
12. Zayniddinovich S. Z., Tuygunovich B. M., Rakhmatov M. I. The Main Malfunctions that Occur in the Engine's Krivoship Shatun and Gas Distribution Mechanisms //CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES. – 2022. – Т. 3. – №. 11. – С. 47-50.
13. Avlyyokulov, J.S., M. Rakhmatov, R.D. Tadzhiev. "Requirements for Transmission, Steering Gears Control And Suspension of the Carher for Hot Climate Conditions." Texas Journal of Engineering and Technology 14 (2022): 4-6.