ECONOMIC SUBSTANTIATION OF CALCULATION OF THE PROGRAM OF MAINTENANCE AND CURRENT REPAIR OF VEHICLES (MAN)

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Abstract: Meanwhile market economy, meeting unlimited needs from limited resources is one of our highest goals. Rational use of the raw material base will boost the country's economy. This, in turn, ensures cost-effectiveness and achievement of the desired goal by improving the products and services produced in various industries. Undoubtedly, the automotive industry is one of the leading industries today. Therefore, maintenance and repair work in this area is very important. With this in mind, we discuss in the article the analysis of the impact of internal factors affecting the maintenance and routine maintenance of vehicles.

Key words: Maintenance, current repair, efficiency, consumption, shift, truck

Introduction Modern transport must meet the real conditions of the external environment (economic and technological) to ensure normal operation and growth in the market of transport services. Unfortunately, the technical base for the production of many vehicles today does not meet today's requirements. In addition, due to the obsolescence of development regulations and the inability to provide maintenance and repair programs for modern transports, the current repair costs have increased, so it is necessary to develop a scientific approach to this situation. The development of a program of maintenance and repair of modern cars requires the development of guidelines that meet modern requirements.

The task before us is to improve the methodology for calculating the maintenance and repair production program, the choice of vehicles based on the conditions of international transportation, to determine the specific cost of labor in the current repair work.

The object of the article is to improve the methodology for calculating the maintenance and current repair production program of a car service with high-resource rolling stock.

This article used the methods used to acquire new knowledge and evidence, discover new formulas, improve theory and develop practical recommendations, methods of collecting and processing scientific and practical data: observation, comparison, analysis.

The research method of selecting the solution of the selected specific problem requires a sequence of solving specific problems based on the conditions, requirements and limitations of the research. For example, the improvement of the calculation method of the maintenance and current repair production program determines the sequence: first the quantitative indicators (factors) are evaluated, then the qualitative indicators. These are a means of addressing the purpose of the study.

Rozhdestvenskiy, Yu.V., Ivanov, D.Yu., Gavrilov K.V., Levanov, I.G. "Modern problems and directions of development of constructions of cars".

Khasanov R.X. "Fundamentals of technical operation of automobiles."

Xamraev. Oh, Magdiev. Sh, Qodirov. T "Fundamentals of car service"

Usmonov. J "Regulations on maintenance of rolling stock of the Republic of Uzbekistan"

I also used foreign literature and internet materials.

From foreign scholars in the United States:

Jean-Paul Rodrigue «The Geography of Transport Systems»; Lester A. Hoel.Nicholas J. Garber. Adel W. Sadeklarning Transportation infrastructure Enjineering A Multimodal Integration;

Kimball, Cheryl. Startur. Start your own Transportation service Taxi. Limousine. Rideshare Trucking. Specialty. Medical Description;

Belyaev VM "Organization of automobile transport and traffic safety."

I used the literatures above to organize service work, perform technological calculations and identify modern trends in the subject.

There are special requirements for vehicles. The most important of them is environmental friendliness. Therefore, the article considers the least harmful to the environment.

In this literature, the operational characteristics of the process of transportation of vehicles by the method of calculation of the production program for maintenance and repair of rolling stock, are described in detail. The article reviews the truck service process using the literature mentioned above.

150 MAN will be put into practice by economically justifying the organization of maintenance of truck loads. The cost of the service is calculated and compared with the market price, the degree of competition is taken into account when creating a service program. the bank loan interest is charged on the funds required for the implementation of the project, the repayment

period of which should not exceed the condition.Such an economic justification is made in the following sequence:

1. Preliminary data on the organization of maintenance of 150 MAN trucks are given in Table 1.1.

2. The main fund and production fund of the organization of maintenance of 150 MAN trucks is calculated.

3. Calculation of the organization of maintenance of 150 MAN trucks, the annual volume of maintenance and the cost of preparation (per unit of service).

4. A production program will be developed for the organization of maintenance of 4,150 MAN trucks.Revenue from it is cost, gross profit, depreciation and amortization.

5. The payback period for the organization of maintenance of 150 MAN trucks.

6. Indicators of the use of fixed assets: return on assets is the number of revolving funds, annual labor productivity, profitability.

I. Equipment, resources involved in the service process, their market prices and consumption norms (Table 1.1).

Table 1.1

#	Name of indicators	Unit of measurement	Value
1	Organization of maintenance of 150 MAN trucks	Piece	1
2	The project cost is the introduction of the organization of maintenance of 150 MAN Euro-5 trucks	mln.soum mln.soum mln.soum	692000 950000*150= 142500000 151364000
4	ATC productivity in the current Repair system	km/ day	72000
3	YMM standard: Fuel Oil	 Soum/lit Soum/lit	 5500 24000
6	Number of employees: Drivers Repairmen	 People People	 240 45
7	Number of shifts	Shift	2,0
8	The average salary of workers	mln.soum.	4500,2500,1000
9	Number of working days per year	Day	303

II. The main and maintenance fund for the organization of maintenance of 150 MAN trucks is calculated.

Also, the calculation of the service fund for the organization of work (cost) The cost of construction of the truck depot F_{cons}* 800= 8650*800=692000 mln.soum, The cost of freight cars 950000*150=142500000 mln.soum

Total freight cost of the car park 692000 +142500000= 151364000 mln.soum.

1)F_p = 151364000 mln. soum

3) Total fixed asset valueF_t= 151364000 mln. soum

4) Working capital value $F_w = F_t$*0,14=151364000 * 0,14=20046880mln. soum

3) We find the total value of the production fund "$\sum F_p$".

$\sum F_p = F_t + F_w$= 151364000 +20046880= 163238880 mln. soum

$\Delta F_p = F_p * K$=163238880*0,14=51583443 mln. soum

$K = \sum F_p + \Delta F_p$= 163238880+ 51583443=186092323 mln.Soum

III Annual maintenance volume and preparation cost (per unit of service) for the organization of maintenance of 150 MAN trucks

a) annual service volume:

$\sum Q = d_{n1} * D_{wc}$= 72000*303=21816000 km/year, herein

d_{n1} – Cargo ATK productivity 150 cars =72000 km/day

D_{wc} - calendar days at work, 303 day

IV The cost of arranging maintenance for 150 MAN trucks will be found. Income is cost, gross profit, depreciation and amortization. We calculate the unit cost of the service provided at the station. The cost of manufacturing a production unit is found by the following model:

$D_1 = m_1 + X_1 + X_2 + X_3 + X_4 + X_3 + X_6 + X_8 + X_9$,

m_1 labor cost per unit of product

X_1 - fuel consumption

X_2 - consumption of lubricants

$X_з$ - the cost of preparing the equipment for use

X_4 - tire consumption

X_5 - depreciation expense

X_6 - operating expenses

X_8 - gross profit

X_9 - Allocation of profits for the road fund

A) M_1 – Calculation of monthly salary expenses for a machine worker (driver)

$M_1 = T_g * C_т * K_д * 1{,}28 / \sum Q$;

Herein: T_g – annual working hours of the designed bench

Kd – coefficient of overfulfillment of the plan 1.2

$T_g = D_{wc}* T_c* n* N_{cw}$=303*7* 2*120=538734hour/ year

D_{wc} – number of workers 303 day

T_c – shift duration 7 hours;

n- number of shifts 2,0

N_{cw} - The number of cars in operation is 120

$m_1 = T_g *C_т*K_d *1,28 /\sum Q$ =538734*23788*1,28/21816000 = 752 soumm/km, herein

T_{year} – Annual balance hour of the projected car park;

$T_{year} =D_{wc}*T_c*n*N_p$ =303* 7*2*127=538734 hour/year, herein

D_{wc} –303- workers of the year;

T_s – shift duration, 7 s;

n - number of shifts 2

N_a - number of cars at work 127 cars;

$C_т$ – (M/F)K_1= $\frac{3500000}{169,2}$*1,15=23788 soum/year, herein

M – the amount of the monthly salary of the equipment worker; 3500 mln.soum

F – monthly balance hour 169,2 hour

K_1 – fog coefficients 1,15;

K_d – the coefficient that takes into account the overfulfillment of the plan (1,2);

j – the balancing factor of the equipment worker;

$\sum L_t$ – the total mileage of annual vehicles

Б) 0,28 – social allocations;

В) Fuel consumption $X_1=\frac{F100}{100}*H_1*K_2$ soum/km

$X_1=\frac{42}{100}$*5500*1,03=2379soum/km

K_2 – coefficient taking into account the winter period 1,03;

F_{100} – fuel consumption is 42 liters per 100 km

H_1 – The cost of 1 liter of fuel 5500 soum/lit

3) Consumption of lubricants.

$X_2=X_{21}+X_{22}+X_{23}+X_{24}$soum/km

X_2=302+30+30+30=392 soum/km

$X_{21}=M_{100}H_м*\frac{F100}{100}$soum/km

X_{21}=0,03 *24000*$\frac{42}{100}$=302soum/km

$X_{22}=TM_{100}H_т*\frac{F100}{100}$soum/km

X_{22}=0,003* 24000*$\frac{42}{100}$=30soum/km

X_{22}= X_{23}= X_{24}=30soum/km

X_{23}=CM_{100}*H_c*$\frac{F100}{100}$

X_{24}=$\frac{M1000}{1000}$soum/km

H_m– Price of 1 liter of oil 24000 soum

M_{100} – Fuel consumption per 100 liters is the standard for a truck - 0,033

$H_т$– Price of 1 liter of transmission oil 24000 soum

TM_{100} – Price of 1 liter of transmission oil 24000 soum transmission oil standard per 100 liters of fuel (0,003)

H_g – Price of 1 liter of grease 24000 soum

GN_{100} – Price of 1 liter of grease 24000 soum grease consumption rate (0,003)

Consumption rate of 1 grease is the rate of consumption of grease per 100 liters of fuel (0,003)

M_{1000}– Minor consumption and wiping materials per 1000 km

4)X_3- the cost of preparing moving content for use

X_3=X_{31}+X_{32}+m_2;soum/km

X_3=67+52+293=412soum/km

а) X_{31} – spare part consumption

X_{31}=$\frac{Mspc}{1000}$*K_3

X_{31}=$\frac{56000}{1000}$*1,2=67soum/km

M_{spc} – Spare part cost per 1000 km 28000 soum

K_3 – coefficient taking into account road conditions.

K_3=1.0- for the first category road

K_3= 1,1 For II and III category roads

K_3= 1,2 For IV and V category roads

б) X_{32} – consumption of materials

X_{32}=$\frac{Mcm}{1000}$*K_3

X_{32}=$\frac{40000}{1000}$*1,3=52soum/km

M_{cm}–Material consumption for 1000 km mileage 20000

в)m_2=1,3*m_1*H_{21}=1,3*752*0,30=293;

H_{21}– the number of car mechanics per car:

For the truck 0,33

1.3 The coefficient of comparison of the salary of a car mechanic with respect to the driver. This is 1.2-1.3 for freight and bus.

3) Tire consumption «X_4»

$$X_4=\frac{Ht*n}{lp}$$

X_4=2000000*14/140000=200 soum/km

H_t – Price of 1 set of tires 200 mln.so'm

L_t – tire life 140 m.km

n – the number of moving tires is 14

6) The cost of restoring moving content

X_5= K *E_n/∑Q

X_5=186092323000*0,12/21816000=1023 soum/km

K – Balance sheet value of moving content.

Taking into account the loan interest for the ATK project 186092323 mln.so'm

E_n–0,13 normative coefficient of efficiency

D_{wc}– working days of the year

L_{day} – average daily mileage

7) «X_y» we calculate the incomplete cost

$X_y=m_1+X_1+X_2+X_3+X_4+X_5$=752+2379+392+412+200+1023

=5158 soum/km;

$X_m=X_y+X_6+X_9$= 5158+1612+483=7253 soum/km;

$X_6= D_1* \eta_6$= 8059*0.20 =1612 soum/km

$X_9= D_1* \eta_9$= 8059*0.06=483 soum/km

We determine the share of incomplete cost in revenue ηxy

$\eta_{xy}=1-(\eta_6+\eta_8+\eta_9)$ η_6=0.20 η_8=0.10 η_9=0.04+0.02=0.06

η_{xy}=1-(0.20 +0.10 +0.06) =0,64

8) We will determine the tariff on the account D1

$D_1=X_y/ \eta_{xy}$;

D_1=5158 /0,64= 8059 soum/km

10) We define the annual production program $\Sigma Д_1$; ΣX_m; ΣX_8

$\Sigma Д_1=Д_1* \sum L_t$

$\Sigma Д_1$=8059*21816000=175815144000 soum/year

$\Sigma X_m=X_m*\sum Q$ =7253*21816000=158231448000 soum/year

$\Sigma X_8=\Sigma Д_1-\Sigma X_m$=175815144000-158231448000=17583696000 soum/year

$X'_8=\sum X_8*j_{sol}$=17583696000*1=17583696000 soum/year, herein

J_{tax} – profit tax ratio (1).

1) We determine the internal capacity to repay the loan received

$\sum X_{iim}=\sum X_5+\sum X_{'8}$ = 22317768000 +17583696000=39901464000 soum/year

2)$\sum X_5 = X_5*\sum Q*j_r=1023*21816000*1=22317768000$ soum/year

We will determine the deadline for returning the capital investment received for the project to the bank. We will determine the minimum whitewash period of the designed truck palace.

$T_{o'k}=\sum F_p / \sum X_{im.}$ =186092323 :39901464000=4,66 year

VI. We determine a number of indicators of the use of fixed assets: return on assets, the number of revolving funds, cost, productivity, profitability of production

$\sum F_p = F_m + F_r$= 151364000 +20046880= 163238880 mln. soum

$\Delta F_p = F_p * K$=163238880*0,14=51583443 mln. soum

$K= \sum F_p + \Delta F_p$= 163238880+ 51583443=186092323 mln. soum

1) We determine the return ratio of the fund K_{rf}

$K_{rf} =\sum D_1/F_p$=175815144000 /163238880000=1,07 soum/soum ,herein

2) The effective volume obtained from modernization

3) $E=\sum X_{im}$.

4) We define productivity

a) technological workers

$P_{tech}=\sum D_1/P_т$=175815144000/254=692185 mln.soum/person, herein

P_{tech} – number of technological workers (equipment workers and masters)

b) general workers

$P_t=\sum D_1/P_t$=175815144000/277=634711 mln.soum/person, herein

$P_t=P_{tech}+ P_{om}$=254+14+9=277 person, herein

P_{om} – other managers are 9 people and 14 repairmen

Table 1.2

Economic basis for improving the method of calculation of moving contents maintenance and current repair production program

#	Indicators	Symbols	Unit of measurement	Value
1	Project to improve the calculation method of the maintenance and current repair production program	N_p	Com	1

2	Fixed assets	$\sum F_m$	mln.soum	151364000
3	The volume of revolving funds	F_r	mln.soum	20046880
4	Capital for the project	F_p	mln.soum	186092323
3	Fund return	K_{fr}	soum/soum	1,07
7	Number of drivers	P_{tech}	Person	254
8	Total number of employees	P_t	Person	277
9	Labor productivity			
	- to technical workers	P_{tw}	mln.soum/person	692185
	- general workers	$П_{gm}$	m.so'm/person	634711
10	Total cost	$\sum X_m$	mln.soum	158231448
11	Accounts receivable	$\sum D_1$	mln.soum	175815144
12	Net profit	$\sum P_{np}$	mln.soum	17583696
13	Annual fruit	E	mln.soum	39901464
14	The payback period of the investment	T_{pp}	Year	4,66

Table 1.3

Economic efficiency indicators

Names of indicators and units of measurement	The value of indicators
1. Annual production costs for maintenance and repair mln.soum	186092323
2. The amount of annual cost reductions mln.soum	7583696
3. Payback period of capital investment	4,66
4. Cost-effectiveness of project implementation	39901464

It was concluded that the project to organize the maintenance of 150 MAN trucks was based on today's market demand.

Conclusion To conclude, in order to conduct an experimental study to test the idea that it is possible to determine the program of maintenance and current repairs for existing mobile enterprises of foreign-made cars, in the case of implementing the full idea of maintenance, cars We take into account the mileage of the walk in the regulations of the full complex maintenance.

However, in each individual case, the impact of vehicle downtime on maintenance and its timing on the overall performance of the maintenance and maintenance production program can be seen in the calculations and tables above can be viewed.

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