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Theoretical Research Of The Technical Operation Indicators Of Grain Transportation Of New Generation High-Capacity Trucks

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Abstract:
In the article, the new generation used in grain transportation in the Republic the conditions of use of trucks are analyzed and their exploitation indicators that is, the basic requirements for the choice of trucks, transport works in the transport of grain, Organization of the work of aggregates, grain in transportation, Interaction of parameters of grain combines and new generation trucks in grain transportation, the main work on grain transportation of new generation trucks indicators, trucks in the process of transporting grain products run, truck grain transportation average commute distance, grain distance moving average, moving speeds, working performance of trucks the main operational indicators of the impact are theoretically determined improved.

Keywords: *Trucks, squad members, grain collection, grain transportation, vehicle, transportation distance, transportation time, impact factors.*

INTRODUCTION

Identify the main factors affecting the grain transportation process. When it is called the selection of types of new generation trucks to the grain transportation process, it is understood that the car transport is more adapted to the character of cargo transportation to the palace. When choosing trucks, it is necessary to pay attention to the technical, operational and economic specifications necessary for their high efficiency operation [1]. Especially when transporting goods, it is necessary to ensure that the transport cost is as cheap as possible, without reducing the quantity and quality of the goods. The main requirements for the choice of trucks. When choosing a truck, it is necessary to take into account the most effective use of it, as well as the following:

- the type of cargo of the selected truck and its compatibility with the body;

- load quantity (volume);

- transportation distance;

- use of cars in the transport of cargo, especially in all kinds of road and climatic

conditions;

- methods of stowing and unloading operations.

Transport work on grain transportation. The main part of the grain (80...85%) from the field is transported to the farm warehouses, after which it is transported to the reception and manufacturing points. If the grain is transported directly from the combine to the receiving points or farm warehouses ,

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then the transport work will be interrelated, if the grain is transported from the field thresholds to the receiving points, then the transport work will not be interrelated [2]. In our Republic, grain is now transported directly from the combine to the receiving points, as well as to the farm warehouses, so the transport work is interrelated, and it is desirable to draw up a graph of the mutual agreement between the combine and the vehicle, otherwise the combine will be waiting for vehicles or the vehicles will be waiting for the combine to fill the bunker. Organization of the work of aggregates. Combines should be used as a group-group. It is good to provide them with maintenance, fuel, water, grain transportation, organize cultural services to combiners, in addition, the work output will increase significantly. When combines work in a group, it is necessary to walk behind each other in a circular way. If the rotation of the motovila in a holistic high place is difficult, and a bruise falls on it, it is necessary to reduce the speed of the combine, but not to reduce the number of rotations of the elbow val. [3]. When emptying the bunker, it is necessary to empty it by walking along the truck without stopping the combine. Therefore, it is necessary to determine in advance the place of emptying the bunker, as well as determine the required number of transport techniques. The formula for the road rail, which must be pressed by the combine to fill the bunker can be identified with:

L_тех "=" Q_б/(g×B_иш)104"=" 3200/(4000×4,27)104=1874 м; (1)

here, given the Q6-bunker filling coefficient, in the bunkerthe amount of cereals to be packed (the volume of the grain bunker of the combine " Dominator-130 " is 3200 liters); g-gather(yield), (average yield of grain in the field: 4000 kg) t / ha; Vish=4,27 m - of the combine working coverage width. It is possible to determine the desired vehicle in the same way.

"n=" (t_т 〖×Q〗_б)/(Q_т×t_б) = (1,4×4,25)/(9×0,43)=1,54 та; (2)

here is the T- the time that the vehicle went until the delivery of the grain to farm warehouse; t6 is the grain dump representative of the bunker; Qt is the amount of grain that goes to the vehicle. Analysis of the data shows that the exit from the field to the inner path and the go from the road to the main road distance although 30-40 percent of the total road, grain carrier transport due to the inconvenience of moving conditions 60-70 percent of the total time they go to the movement of their vehicles to them will be spent [4]. The result is the working output of grain carrier vehicles it's down 20-25 percent from the mark. Grain harvesters and new generation trucks in grain transport mutual proportionality of parameters. The largest cargo transportation in agriculture the size corresponds to the period of harvest of grain. The period of harvesting grain the clamp and the size of the workload in it make the demand for the vehicle all of a sudden, he gets confused. At the same time, grain means of transportation in relatively severe conditions it works. Watering in the field rags availability, driving grain transportation because of the low connection of the wheels with the soil the tools are moving with a large resistance coefficient and with combinators it will be in a tight tie. As a result, random changes in the work cycle the working output of both combines and grain carrier vehicles leads to a decrease. Proceeding from this, the processes of harvesting and transportation of grain to each other "moderation" of attachment or influence of variable factors developed ways of transporting grain, allowing to ensure flexibility the output is important. According to the results of the research currently reap grain dressing in Uzbekistan the assembly work was more effective than other methods "in the flow method", namely" field " + "combine" + "grain transport vehicle" + " grain pickup punk" organized in view. At the same time, the grain transport vehicles with combines together constitute integrity, and the whole process of harvesting is important is considered a tier. Cultivation of grain crops with a

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spike in the Republic, its harvesting used combines and vehicles used in transportation analysis of indicators, combines and means of transport in the period of grain harvest the following factors influence the mutual proportionality of his work and the extent to which they differ be in the following levels: grain yield Уд, levels-20 TS / ha; 30 TS / ha; 40 TS/ ha; 50 TS/ha and 60 TS / ha; the ratio of the grain to the straw Мдс, the levels-0,75; 1,0; 1,25; 1,5 and 1,75; transported grain density Rd, levels-650 kg / m 700 kg / m; 750 kg / m ; 800 kg / m ; 850 kg / m and 900 kg / m3; radius Rm of grain transportation, levels-3 km; 7 km; 11 km; 15 km and 19 km. combine permeability Ability (Second working flour) JV, levels-3,0 KG / s; 5,5 5,5 KG/s; 8.0 KG/s; 10.5 kg / s; and 13,0 KG / s; camping bunker capacity OB, surface - 2,0 M3; 3,0 M2; 4,0 M3; 5,0 M3 and 6,0 m*; the average working speed of the Combine is Vk, the levels are 2,0 km/h; 3,6 km/h; 5,0 km / h; 6.5 km / h and 8.0 km / h; the width of the coverage of the combine jet is VJ, levels-4,0 m; 5,0 m; 6,0 M and 7,0 m; working flour of combine harvester shnegi Qt, levels-5,0 t / Min; 7,0 t / Min; 9,0 t/ Min; 11,0 t / Min and 13,0 t / Min; grain carrier vehicle body Vmp.K, surface - 3,0 M3; 6,0 m ; 9.0 M3; 12.0 m2 and 15.0 M3; grain transportation vehicle speed Vmp, levels-2,0-3,0 km / h (in the field); 8-10 km/h; 20-30 km/h (from internal affairs); 40-50 km / h; 60-70 km/h; grain transport vehicle load capacity Тюк, levels-3,0 t; 5,0 t; 7,0 t; over 9,0 t and 10 t. The main work in the new generation of trucks indicators. The process of transportation in trucks is interconnected and consecutive executed operations (filling of the combine grain bunker, their cargo increase in their cars, delivery to the specified address, unloading of goods, cargo cars), which consists of a pile and load it will be executed through cars [5]. Planning the work of freight AV cars, specific technical-operational indicators for accounting and analysis the system will be used. They include the following: trucks working mode of Transportation, speed of movement, the use of load-bearing coefficient, the use of productivity (or work performance) from a certain distance path coefficient, to the operation of increasing grain products to trucks spent time and so on. General concepts. Units of measurement used in trucks the following is an expression: a) moving and waiting for trucks time spent on the process, hour; b) measured in kilometers, truck the distance traveled by the tool, kilometers; C) measured in tons, transported grain weight of products. The use of trucks in the process of transporting grain products.Load-bearing and further use of new generation trucks. Yug the static coefficient of the use of lifting(y.ст) is the load that is practically transported quantity (qa) to the nominal load bearing of the car (a.) the ratio is. This the indicator is different in different trucks and MAN 26.280 GLD cars if we look at the example, it is determined that: the nominal load of the truck lifting capacity qн = 14t, body size 13m3 and the average of the transported grain given the density 900 kg/ m3, we generate the following value for a single running:

"γ" _"ст" "=" q_a/q_н "=" 11700/14000 "=" 0,9; (3)

its average value for several running (Zк):

"γ" _"ст" "=" Q_a/〖"Z" _"к" ×q〗_н =151,2/(12×14)=0,9; (4)

Different quantity of load bearing is different in different types of trucks it is enough to use the coefficient of static load-bearing when transporting over distances it will not be. Therefore, in addition to it is practically done TKM transport in the process of transportation of the case, when the rated load bearing is fully used the dynamic coefficient, which is the ratio to the quantity, is also used [6]. This coefficient for one truck and several laden runnings :

"γ" _"ст" "=" Q_a/〖"Z" _"к" ×q〗_н =151,2/(12×14)=0,9; (5)

Average distance traveled by trucks for grain transportation, average grain transportation distance.

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One-day average running distance of trucks depends on how fast (intensive) the drivers work, the fuel consumption, TCC chart, reflected in the volume of transport work in the planned or accounting period finds. Average transportation distance is, 1 t how much distance the cargo is transported on average it shows and it is transported measured in tons of ton-kilometer cargo turnover the amount of cargo is determined in the style of the ratio to (Q) :

L_ўр "=" P_к/Q_к , км. (6)

Because the amount of L for a once laden commute is equal to the interaction of L with

L_ўр "=" P_к/Q_к =(q_a L_юк)/q_a =L_юк (7)

Movement speeds. Vehicles ' performance in the work of trucks a circle with a speed of movement is a circle-circle connection. As for the speed of movement, first of all, the traction of the car is a dynamic feature and depends on its technical condition. Furthermore in addition, the speed of movement road-climatic conditions, the intensity of movement on the roads, drivers ' qualifications speed movement safety and job crash must provide. Technology of transport works loading, loading and unloading consists of processes. The main requirement for the means of transportation of goods is this: the load on the bun is not damaged, its appearance and quality do not break, the main thing is that it needs to be delivered to the address quickly [7]. More effective indicators of the speed of movement within road conditions the width of the track movement part, the intensity of the movement, the position of the track cover, the appearance conditions, radius of curvature of the road, the importance of slope length, load bearing improvement of the regulation of movement enters into vs. Technical movement speed (V -) of cars on the same roads (Lкм) the ratio to the time (TI)spent on crossing paths is determined in the style: For single vehicle:

Vт"=" L/T_х "=" 234/4,58 "=51" км/соат; (8)

For the palace of cars:

Vт"=" L/(A×T_х) "=" (234×19)/(19×4,58) "=51" км/соат; (9)

With the regulation of road traffic when calculating the technical speed of movement parking stops on the road for a very short time (traffic lights or simple crossroads, railway and so on) and so on will be added to the time of movement. The main exploitation affecting the working performance of truck indicators. Its time when any equipment or equipment is called a work unit the output produced in the unit is understood. Cars are known loads given that the distance would give transported. Their work output is in the unit of time from the amount of cargo transported, that is, tons-from the work of transport measured in kilometers the phrase is [8]. For example, in the amount of cargo on one flight by car cargo measured work productivity:

Q=q_H×"γ" _"ст" =14×"0,9=12600 кг=12,6 т" ; (10)

if the ton-the transport work done in kilometers:

"P" _"к" =q_H×"γ" _"ст" ×L_юк=14000×0,9×10= 126000 кг=126 ткм; (11)

According to the report, it is reported that it is a working day of trucks:

Q=q_H×"γ" _"ст" ×Z_к=14×0,9×12=151,2 т, (12)

"P" _"к" =q_H×"γ" _"ст" ×Z_k×L_юк=14×0,9×12×10=1512 ткм; (13)

will be. Herein Z-the number of Laden runnings during a working day.

In turn, the time spent on zero flights is also taken into account one working day number of paid runnings:

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"Z" _"к" "=" T_м/〖 T〗_қат "=" 14/1,14 "=12,3;" (14)

Herein t-the time of the car to be at work, hours; Ткат- the time required for a full commute, hours. The time required for a full commute is a unload it from the vehicle's cargo handling unit cargo transportation from the cargo deck to the cargo deck, cargo transportation from the cargo deck to the cargo deck it consists of a set of idle travel time and an increase in landing time will be:

Тқат=То-т+Тташ +Тюксиз=То-т+Тташ +Тюксиз=0,75 +0,28+ 0,25=1,14 соат (15)

Herein: To-t-the time, which went to the car to increase the load, the clock. Тташ-transportation time gone for, hours. Тюксиз -the time of walking the car without cargo, hours. Move the distance of Laden and empty flights to determine the time of movement speed should be divided into:

"Тҳ=" L_м/V_м "=" (L_юк+L_юкс)/V_м "=" L_юк/(β×V_T)+T_(о-т)=0,4+0,75=1,14 соат; (16)

herein: t-determination of the time of movement; Lюк-a car-laden haul distance; Lux- distance the idle speed of the car; V, - the technical speed of movement of the car. In practice, taking into account the exact amount of the empty route distance, the determination of its holding position relative to the loaded way, the use of productive distances, that is, the indicator of the coefficient of the loaded way, is used. This coefficient is defined as the ratio of the total distance of the total number of Laden ways to the total distance, which characterizes the extent to which the overall way is used, and is determined by the character of the letter в (betta) in the technical literature. If the coefficient of use of a lorry's loaded ways distance and road traffic (road) is known, the time of movement of the truck is determined as follows:

"Тҳ=" L_юк/(β×V_T) "=" 10/(0,5×51)=0,39соат; (17)

Go to the grain storage facility from the field-and in the meantime to come:

Тқат=То-т+Тташ+Тюксиз="То-т+Тҳ" ="То-т+" L_юк/(β×V_T)=(L_юк+β×V_T×"То-т")/(β×V_T)=

=(19+0,5×51×"0,75")/(0,5×51)=1,14 соат; (18)

If the time of arrival and the time of stay of the lorry on the route (Тм) is known, the amount of hauls during the working day can be calculated according to the following formula:

"Z" _"к" "=" T_м/Тқат=(T_м×β×V_T)/(β×V_T×〖T_(о-т)+L〗_юк) "=" "13,76×0,5×51" /"10+0,5×51×0,75" "=" "350,88" /"29" "=12,01;" (19)

в - use of road coefficient.

So, in order to increase the number of charged hauls during the day, it is necessary to extend the working day truck (working time or decimal point)or to reduce the time of one rotation (decimal point), or to increase the decimal point in one neighborhood and reduce its salary. Transportation distance in order to reduce the time of arrival from the fieldto the grain storage facility, it will be necessary to increase the technical movement speed of the truck and reduce the cancellation time of the car in the over-loading operations. The one-hour working capacity of the vehicle is calculated according to the formula: is:

"WQ=" Q_к/T_иш "=" 151,2/13,7=11,1 т/соат; (20)

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"WP=" P_к/T_иш =1512/13,7=111 ткм/соат; (21)

Herein Wo -a one-hour working unit of a vehicle unit rotating AT T/H; Wp is a one-hour working unit of a vehicle unit measured at TKM/H. To the above formulas (20) and (21) the appearance of the above formula, if the one-day working unit of the vehicles in the formula is put :

"WQ=" (q_H×"γ" _"ст" ×β×V_T)/(β×V_T×〖T_(о-т)+L〗_юк); (22)

"WP=" (q_H×"γ" _"ст" ×β×V_T×L_юк)/(β×V_T×〖T_(о-т)+L〗_юк) (23)

will be.

According to these formulas, the factors affecting the working performance of cars will be: the load-bearing capacity (qн) of the vehicle, the coefficient of use of the load-bearing capacity (уст), the distance (Lюк), the coefficient of use of the road (B), the time of cancellation (T0-t) in the over-loading operations, the technical movement speed (Vт) of the car. These six factors, noted, cover all the operational conditions associated with cargo transportation, and in practice the change of one of them will also affect the working performance of the car. The impact of major technical-operational factors on the performance of vehicles. It is important to know the extent and character of the impact of certain technical and operational factors on the road and methods of increasing the efficiency of automobile vehicles, the correct organization of the transportation process, the increase in the working efficiency of the car and the cost of transportation. Car load bearing (qн) and the coefficient of its use the same can be determined the impact of (y.ст)on the performance of cars. Encumbrance the variable quantity of lifting (qн), so that the remaining factors are unchangeable, (22) the formula can be expressed as follows:

"WP=" a_q "×" q_H; (24)

Herein aq is a constant, the amount of the coefficient

a_q=("γ" _"ст" ×L_юк)/(L_юк+T_(о-т)×β×V_T); (25)

will be equal. according to the formula (24), the change in the working capacity of the car is appropriate to the change in its rated load, that is, worthy (proportional) to bypass the change of the lifting the change in productivity is subject to the law of the cross line. When analyzing the effect of the coefficient (уст) of the use of load on the working performance of a vehicle, it is also deduced from the above conclusion, that is, the connection between them also arises from the fact that according to the law of the straight line. Only in this case

"WP=" a_"γ" "×" "γ" _"ст" ; (26)

is equal to the constant coefficient

a_"γ" =("γ" _"ст" ×β×V_T×L_юк)/(L_юк+T_(о-т)×β×V_T)=("0,9" ×10×0,5×51)/(10+0,75×0,5×51)=8; (27)

which in quantitative terms differs from the previous coefficient in quantity. The following conclusions were made when the theoretical study of the technical operational indicators of grain transportation of new generation trucks with high load-bearing capacity was carried out:

1.Interaction of the work of transport vehicles for the transportation of combine and grain during the grain harvest there are a lot of chords that affect the proportions and they are different at once can be changed on the level. For this reason, both ensure their mutual proportionality it is a difficult matter, and this is the work of harvesting their interconnection "softening" can be provided by additional link (motor) shading.

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2. Dominator-130 combine grain bunker filling Lтех=1874 m distance it will have to pass.

3. Analysis of the data shows that the exit from the field to the inner path and the going from the road to the main road distance is 33-40 percent of the total road.

4. Static coefficient of UE lifting use MAN 26.280 GLD load for a car, уст = 0,9.

5. Working day of a truck to increase the number of cargo flights during the day (working time or decimal image)extend or one rotation time (decimal Max) it is necessary to reduce. Transportation distance storage of grain from the field in a given case to reduce the time of arrival and departure, the technical speed of the truck increase and increase in the car-the time of cancellation in landing operations will be subject to reduction.

6. On account of the decrease in the time of standing in the car's increase-unloading operation his work productivity will increase, while his work productivity will decrease for a while reduces the yield.

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