

EFFICIENCY OF TECHNOLOGICAL DEVELOPMENT OF CAREER VEHICLES Karimov Sh.V.¹, Madaliev O.H.², Ermakov D.E.³, Turdiev T.B.⁴ (Republic of Uzbekistan)

¹Karimov Sherzod Vafo ugli - candidate of technical sciences, associate professor;

²Madaliyev Oybek Xasan ugli - student;

³Ermakov Daniil Evgenivich - student;

⁴Turdaliyev Talgat Bekzat ugli - student,

DEPARTMENT OF MINING,

NATIONAL RESEARCH TECHNOLOGICAL UNIVERSITY "MISIS"

ALMALYK, REPUBLIC OF UZBEKISTAN

Abstract: one of the most time-consuming and expensive processes is the transportation of rocks. For the transportation of rocks, mainly road transport, conveyor and railway transport is used. Of these, the one that is widely used at this time and has many advantages is road transport.

Keywords: quarry vehicles, road transport, railway transport, excavators of cyclic action, maneuverability and mobility of vehicles, carrying capacity of vehicles, diesel fuel, electricity, adaptability, vehicle management system, monitoring and dispatch management.

ЭФФЕКТИВНОСТЬ ТЕХНОЛОГИЧЕСКОЙ РАЗРАБОТКИ КАРЬЕРНЫХ АВТОМОБИЛЕЙ

Каримов Ш.В.¹, Мадалиев О.Х.², Ермаков Д.Е.³, Турдиев Т.Б.⁴ (Республика Узбекистан)

¹Каримов Шерзод Вафо угли - кандидат технических наук, доцент;

²Мадалиев Ойбек Хасан угли - студент;

³Ермаков Даниил Евгеньевич - студент;

⁴Турдалиев Талгат Бекзат угли - студент,

кафедра горного дела,

Национальный исследовательский технологический университет «МИСИС»

г. Алмалык, Республики Узбекистан

Аннотация: одним из самых трудоемких и дорогостоящих процессов является транспортировка горных пород. Для перевозки горных пород используют в основном автомобильный транспорт, конвейерный и железнодорожный транспорт. Из них наиболее широко используемым в настоящее время и имеющим множество преимуществ является автомобильный транспорт.

Ключевые слова: карьерные машины, автомобильный транспорт, железнодорожный транспорт, экскаваторы циклического действия, маневренность и подвижность машин, грузоподъемность машин, дизельное топливо, электроэнергия, адаптивность, система управления машинами, контрольно-диспетчерское управление.

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The main volumes of transportation of minerals and overburden currently account for road and rail transport, that is, cyclical transport. This situation is mainly explained by the use of cyclical excavators in the vast majority of domestic quarries and excavators.

The most rapid development among other types of career transport over the past 10-15 years has been automobile transport. The main advantage of motor transport - maneuverability and mobility - ensured its efficiency in a variety of conditions, including during the construction of enterprises, in remote areas, etc.

The main trend in the development of career vehicles is to increase the carrying capacity of cars as a means of increasing the efficiency of transportation. This trend is clearly manifested in domestic practice.

With the deepening of quarries, the shortcomings of motor transport begin to manifest themselves sharply, limiting its effective use and forcing us to switch to complicated transportation schemes.

Such disadvantages include a relatively low speed of movement on the rise, consequently, a decrease in the performance of cars, an increase in fuel consumption and intense atmospheric pollution, which in some cases causes a prolonged shutdown of enterprises. On heavy-duty dump trucks with the use of an electric wheel drive, prerequisites are created for the electrification of a heavy-duty highway, i.e. for the creation of diesel trolleybuses, with the use of which the above-mentioned disadvantages inherent in motor transport are leveled.

At the same time, electricity consumption increases, since the total energy costs remain approximately the same. If we take into account the ratio of the cost of diesel fuel and electricity, the total cost of energy for transportation is reduced by 10-20%.

Motor transport, like other types of career transport, has its own field of rational application. Based on technical and economic calculations confirmed by practice, it is advisable to use road transport with transportation schemes up to 20-30 million meters per year and a distance not exceeding 3-4 km.

When assessing the manufacturability of a particular type of transport, its adaptability is considered, i.e. the ability to implement specified cargo flows, the ability to transport rock mass with different characteristics in size, strength, humidity, etc., the ability to be applied to the required pace of mining and deepening, the ability to form into flexible excavating and transport structures, mobility required when the market conditions change.

The most adaptive to the conditions of mining production is road transport. It is this property that has ensured intensive development of motor transport, especially in relation to the development of small, compact, complex-structured deposits, to the development of deposits in the absence or weak development of infrastructure.

The modern stage of the development of career vehicles is characterized by the introduction and development of complex, system automation that monitors, records, planning, management and analysis of the operation of this equipment in order to achieve extremely high performance characteristics of career vehicles.

The introduction of modern automated vehicle management systems that monitor and dispatch mobile equipment has allowed to raise the culture of mining production, reduce downtime of excavators and transport equipment, and increase labor productivity.

The scientific novelty lies in the development of methodological principles for the organization of the work of quarry vehicles, ensuring a reduction in the cost of transporting rock mass by making decisions based on data from an information computer system operating in the mode of continuous monitoring of the condition of dump trucks in real time, including:

- for the first time, it was revealed that the strategy of reducing operating costs for dump trucks is mainly determined by the effectiveness of organizational solutions aimed at reducing the costs of maintenance and repair of dump trucks, tire replacement and fuel and lubricants consumption;

- it is proved for the first time that the integration of various ways to reduce operating costs for quarry dump trucks is possible on the basis of a specialized computer module of the information dispatch system on the operation of road transport in real time, which allows to simulate and reduce the level of operating costs; it is shown that, unlike common statistical approaches, the proposed methods of reducing the cost of operation of quarry dump trucks take into account changes in production and the operational parameters of the equipment in real time

The practical value of the work lies in the fact that the use of the developed methodological principles of organizing the work of quarry vehicles and the Cost Management module implementing them allows, through real-time monitoring, to reduce the consumption of fuel and lubricants, reduce the cost of maintenance and repair of vehicles by 9-11%, reduce operating costs by preventing premature wear tires, parts and parts of dump trucks by 4-6%, and also increase the average productivity of a dump truck per shift by 12-15%.

References / Список литературы

1. *Потанов М.Г.* Направления развития карьерного транспорта // ГИАБ – 1996. С. 104-108.
2. *Герике Б.Л., Артамонов П.В.* Фазы развития систем организации и управления карьерным автотранспортом // Вестник Кузбасского государственного технического университета – 2013. С. 116 - 119.
3. *Лель Ю.Н., Сандригайло И.Н., Терехин Е.Ю., Осипов М.В., Тарасов П. И.* Энергоемкость транспортных систем глубоких карьеров и пути её снижения // Известия Уральского государственного горного университета – 2000. С. 129 - 132.
4. *Большунова О.М.* Пути повышения эффективности использования карьерного автотранспорта // Записки Горного института – 2004. С. 104 - 107.