ISSN NO: 2770-4491
Date of Publication:26-05-2023

Determination of Technical and Economic Indicators of Road Construction Machines

Toychiyev Khasanboy Tokhir ugli, assistant
Andijan machine-building institute
E-mail: xasanboy.toychiyev.toxirogli@gmail.com
Toychiyev Khusanboy Tokhir ugli, assistant,
Andijan machine-building institute
E-mail: husanboytoychiyev55@gmail.com
Bakirov Lutfillo Yuldoshaliyevich, PhD, associate professor,
Andijan machine building institute r
Email: lutfillo.bakirov@yandex.ru.,

Abstract: The technical and economic indicators of road construction machines are studied in this article. Constructive-accounting performance (Pk-h), technical performance (Pt), and operational performance (Pe) were determined.

Keywords: constructive-calculation work efficiency (Pk-h), technical work efficiency (Pt), operational work efficiency, autoplan, stobiloplan, easy.

Introduction

It is important to ensure a high level of driving comfort on the world's highways, to monitor road surface smoothness using new technologies, and to evaluate surface smoothness by taking into account the requirements of road users.

Performance, maneuverability, drive ability, and priority are the main technical and operational indicators of machines. The productivity of the machines is characterized by the amount of product produced per time unit T (minute, hour, shift, month, quarter, year). The output of excavators is expressed in m3, and that of crushers is expressed in t or m3.

Literature Analysis And Methods

Gurin F.V, Klenikov V.D, Rein V.V, in the textbook "Automotive construction technology" on the basic rules of designing technological processes for the preparation of car and tractor parts, basic concepts, types of preparing and their manufacture, the basis and its types, accuracy of cutting, surface quality, cutting topics such as machining allowance, technology of the construction, methods of processing the surface of details, cutting devices, design of technological processes of cutting, automation of technological processes of cutting are fully covered in the chapters[1-3].

Khamrakulov O., Khamrakulov X, "Restoring the working ability of car parts" in the study guide, the methods and technologies of restoring the working ability of the parts that need to be repaired, separated on the basis of defecto-scopy during the complete repair of cars , and Information on the equipment and materials used is embodied.

In the textbook "Internal Combustion Engines" by S.M Kadirov, the theory of the processes occurring in the internal combustion engine of cars, tractors, road construction machines, and the analysis of factors affecting their work cycle, time and fuel consumption and processes are shown. The methods of testing engines and the construction of engines are presented.

Results

When designing machines, their main and main indicators are selected so that the intended performance of the machines and their maximum effective use are achieved. The work performance depends on the working conditions, calculation procedures (road milling cutter cuts the asphalt layer to a certain depth in road construction, bucket lifting speed, pressure speed, etc.) and work equipment, which are more characteristic for each machine. determined by strength[4-5].

The hourly productivity of the machines is determined for the maximum use of the capacity of the operations. In technical economic calculations, it is determined by the amount of product produced by the

ISSN NO: 2770-4491
Date of Publication:26-05-2023

machine in a certain time during comparative analysis during the design process and operational performance of road construction machines .

1. Constructive-calculated productivity (P_{kh}) is determined by the amount of product produced by the machine through the calculated speed and forces during one hour (it does not take into account specific working conditions).

Operate continuously and deliver materials with a continuous flow

P_{q-c} = 3600 F*V, m^3 /hour = 3600 F*V*g, t/hour.

F - the cross-sectional surface of the transferred materials, m^2 ;

V - calculated movement speed of materials, m/sec;

g - volumetric weight of the material, t/m^3

For machines that work continuously and distribute materials in portions

P_{q-c} = 3600 (V/a)*q, m^3 /h = 3600 (V/a) q g, t/h.

a - distance between portions, m;

q - the volume of one portion, m^3 .

And for periodic machines

P_{q-c} = n*q, m^3 /hour = n*q*g, t/hour,

n - the number of cycles in 1 hour, n = 3600/ ts,

$t_s = t_1 + t_2 + ...t_n$, sec.

t_c is the calculated duration of one cycle, sec.

2. Technical performance (P_t): during one hour of non-stop work of the machine, it is determined based on the maximum possible real capabilities under these conditions (the maximum filling of the tub, the maximum possible volume of work etc.).

For periodic bucket machines (scraper, bucket excavator, bucket loader, etc.):

$P_t = n \cdot q \cdot K_t / K_{yum}$, m^3 /hour;

where K_t is the coefficient that takes into account the filling of the tub with materials; q - the volume of materials in the tub, m^3 ; K_s - softening coefficient of soil - $K_{yum} = q / q_{kj}$

q_{kj} - solid volume of soil in the tub (materials), m^3.

K_t and K_{yum} are given in the existing normative (normative) tables for different categories of soils (can be measured).

When determining the operational productivity (Pe) , the coefficient of use of the machine during the day or year is taken into account.

$P_e = P_t * T_{cm} * K_v$, m^3 /shift,

where $K_v = T_f / T_{cm} = (T_{cm} - ST_s)/T_{cm}$ is the time utilization coefficient of the machine; T_f - the actual working time of the machine during the shift; T_{cm} – the duration of the shift (T_{cm} = 8.2 hours) ST_s – the time of all mandatory stops during the shift.

Discussion

At present, there are "Avtoplan", "Stobiloplan", "ASON" and other types of automatic systems used in canal digging machines, drainage laying and leveling machines. In the future, there are a number of problems, such as the creation and production of a complex of automatic systems that control modern (drip) irrigation of agricultural crops.

The main indicators of the effective use of road construction machines are in the reconstruction, processing, maintenance or reconstruction of roads, highways, expressways or streets, and their technical condition, i.e. seasonal maintenance. comparative calculations of the use of the road construction machine are performed and effective options are selected during the demonstration (summer and winter) when performing road works, when designing road construction works, when updating outdated technologies, when choosing the right machines for objects[6-8].

These indicators are:

1. Estimated costs $X_{qc} = T_{year} + E_n \bullet K$.

where, T_{year} is the estimated cost of the annual volume of products produced by the machine;

E_n is the normative coefficient of efficiency, that is, the percentage of amortization allowances;

ISSN NO: 2770-4491
Date of Publication:26-05-2023

K is the amount of capital investment (that is, the price of the construction machine, the cost of bringing it to the construction site).
2. Product unit price (cost).
$T_{sol} = G_{ms}/P_{cm}$, G_{ms} is the machine-shift value.
3. Productivity per worker (including additional workers).
4. Metal capacity – $M = G_m/P_y$. G_m is the mass of the car.
5. Energy capacity – $E = S\ Ne/P_y$. Ne – engine power.
6. Equipment of construction with mechanisms - the price of construction machines and equipment is determined by the annual productivity (produced by these machines) in relation to the price of the product.
7. Armed with energy - the total power of all construction machines is determined by the ratio of N_{engine} to the annual average number of workers R, i.e. $E = Ne/R$.
8. The degree of mechanization of labor is the ratio of the productivity of work performed by mechanisms for any type of work to the total productivity of this type. In construction, it is (approximately) 98%.

Conclusion

The conclusion is that the main parameters of the road milling machine depend on the diameter of the milling machine, the nominal power of the tractor, the power of the tire, the distance between the middle wheels, the overall dimensions of the milling machine, the maximum speed, and technical and economic indicators.

Performance, maneuverability, drive ability, and priority are the main technical and operational indicators of machines.

The productivity of the machines is characterized by the amount of product produced per time unit T (minute, hour, shift, month, quarter, year). The output of excavators is expressed in m3, and that of crushers is expressed in t or m3.

Literatures

1. Askarkhojayev T. Calculation and theory of earth digging and road construction machines. Study guide.-Tashkent, 2006
2. Akbarov A. Construction machines. T.: Teacher, 1992.
3. Bauman V.A., Klushantsev B.V., Martynov V.D. Mekhanicheskoe oborudovanie predpriyatiy stroitelnyx materialov, izdeliy i konstruktsiy. -M.: Mashinostroenie, 2nd ed. 1981.
4. Nozimbek A. et al. IMPROVEMENT OF PHYSICAL AND MECHANICAL PROPERTIES OF PLASTIC PARTS USED IN MACHINE BUILDING //Universum: технические науки. – 2021. – №. 3-4 (84). – С. 52-55.
5. Nozimbek A., Kongratbay S., Khasanboy T. MANUFACTURE OF AUTOMOTIVE PLASTIC PARTS UNDER PRESSURE AND THE FACTORS AFFECTING IT //Universum: технические науки. – 2021. – №. 3-4 (84). – С. 56-59.
6. Bakirov L., Toychiyev X., Toychiyev X. TERMOPLAST POLIMER XUSUSIYATLARIGA MAHALLIY TO ‘LDIRUVCHILARNING TURLARINI TA’SIRINI TADQIQ ETISH //Theoretical aspects in the formation of pedagogical sciences. – 2022. – Т. 1. – №. 5. – С. 310-314.
7. Bakirov L., To‘ychiyev H. SELECTION AND FOUNDATION OF POLYMER BINDER-FILLER SUBSTANCES FOR HETEROCOMPOSITE POLYMER MATERIALS USED IN MACHINE-BUILDING //Science and innovation in the education system. – 2022. – Т. 1. – №. 5. – С. 34-39.
8. To'ychiyev X., Soliyev B. Prospects for the use of polymeric materials in machine parts //Asian Journal of Multidimensional Research. – 2022. – Т. 11. – №. 5. – С. 151-156.