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GENERAL CONSTRUCTION AND AREAS OF IMPROVEMENT power means a classic layout

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The results of the analysis of classical design-layout circuit power means agricultural land.

Mobile power tool layout, classic layout, design and development.

Problem. Mobile energy product (hereinafter - MEW) is the basis for the creation of machine-tractor units (hereinafter - AIT). Volume manufacturing operations that can be performed using this power means and efficiency of its use in determining the composition of the unit tractor fleet management, and hence the cost of the final product. It is the ability to create units for various purposes, and hence the arrangement depends essentially on the structural and Layouts MEW. Recently traktorobudivni company significantly expanded its range of products including the production of non-traditional vehicles for a design-layout circuits (layouts), including classic. It made changes in pricing policies of companies and not always had a positive impact on the cost of the final product of agriculture. In such circumstances are relevant question that addresses the areas of structural and Layouts MEW and comply with the provisions of the State Target Program of technical policy in agriculture.

Analysis of recent research. Structurally Layouts MEW - relative standing of key components and working equipment tractor, with its functionality and allowing the use of tractors with the greatest efficiency. Assembly is subject to a functional purpose and power means characterized by a set of individual design characteristics, namely size and type of propulsion; location of components and systems; availability of space for mounting machines, tools and installation of technological capacities; base; largest road and dedicated crop; coordinates of the center of mass [1].

Operation MEW classical design-related Layouts both undeniable use the advantages and the problems that accompany it. The latter confirms that today do not stop research and development work designed to eliminate the disadvantages called design-layout scheme in one way or another. One of the main problems of classical design-layout scheme at this stage, there are some imperfections general construction of power means to maximize the potential of traction performance and

poor conditions aggregation of machines and tools, especially in the creation of combined units. The latter requires, in many cases, a significant change in the overall design of machines and tools as technology modules for creating such units. In this regard, scientists and engineering industry concentrated its efforts on two areas, namely the development of machines and tools for aggregation of MEW classic layout; improving the conditions of aggregation..

The purpose of research: determine the status and trends of classical design-layout scheme of mobile power products.

Results. Universal-row and multi-purpose wheel tractors are the most common traditional (classical) layout with front-engine, sequential row arrangement of transmission units, rear-cab driven by the front wheels much smaller diameter than the rear (Fig. 1). Transmissions (clutch, gearbox and rear axle) acted in the same block and rigidly connecting the engine. In addition, part of the tractor design-classic Layouts like any other, is chassis, control, operation, and additional support equipment (Fig. 1). With this layout to 70 ... 75% by weight of the tractor in static accounted for rear wheel drive, which support the satisfactory performance traction and front wheels provide management direction of movement. If the front wheels are driven, they perform a supporting role in a high performance traction while working in a humid loose soil.

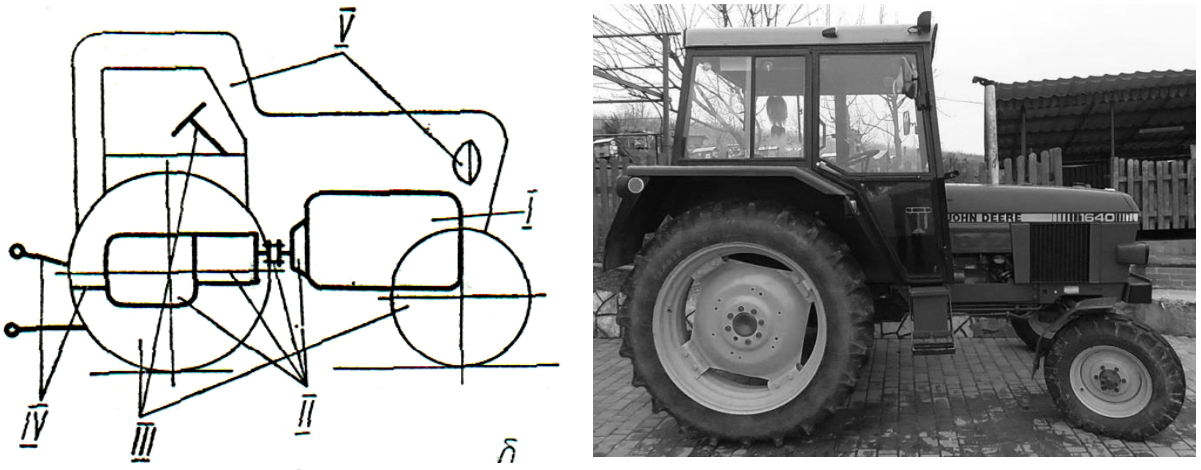

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Fig. 1. Mobile power tool classic layout: a - schematic diagram; B - general view; And - the engine; II - Various transmissions; III - chassis and control systems; IV - working equipment; V - accessories and ancillary equipment.

Classic layout proved its viability through a number of advantages, namely [1]:

- The relative simplicity of construction;

- The maximum-possible (in case of a rear driving axles) using coupling weight tractor;

- Satisfactory visibility trailer or hinged machinery and equipment located on the rear hinged device;

- Shunting satisfactory quality, with the ability to rotate the front steering wheels smaller at large angles;

- Significant Agrotechnical clearance and so on.

This configuration with the vast majority of models of tractors Ukraine and CIS grade of 0.2 (T-012, HTZ-1410, KTP-1611, etc.), 0.6 (T-25A T-30A, HTZ-2511, KTP-3511 etc.), 0.9 (T-40 LTZ-55 HTZ-5020, KTP-6020, etc.), 1.4 (PMZ- 6AKM.40, PMP-8040, PMZ-8240, MTZ-80, MTZ-82; MTZ 100, MTZ-102, Belarus-920, etc.). Minsk Tractor Works embodied the classic layout and traction engines of higher classes, such as Belarus, 1221, 1523, Belarus, Belarus 2022, Belarus-3022, Belarus-3522.

In recent years undergone modernization classic layout. There was a so-called enhanced classic layout (Fig. 2). The difference between this layout from the classic tractor is as follows:

- Larger proportion of the mass of the tractor, which falls on the front axle with 25 ... 30 ... 35% to 40%;

- Increased tire sizes front drive wheels;

- Front gantry bridge replaced by a more powerful motor girder bridge type;

- Angle of the front steering wheels to improve the quality of shunting increased to 50 ... 55 °;

- Provides for installation of front hinged device.

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Fig. 2. Improved design-classic Layouts MEW: A - basic scheme, - a general view.

This configuration of mobile energy resources are in the implementation traktorobudivni leading company John Deere, Fendt, Massey Ferguson, Casse, Valmet, Claas, etc., as well as recent examples of machines Kharkov (HTZ-18040, HTZ-21042) Minsk

(Belarus-1523, Belarus 2022 , Belarus, 3022, etc.), Volgograd (LC-170), Petersburg (K-3000ATM) tractor factories also have a similar layout - Fig. 3.

As mentioned above improvements classical design-layout scheme of mobile energy resources, exactly as in other configurations, is to ensure their effective use in industrial processes, which often is done in two ways, namely the extension of the list of process operations, the implementation of which can provide enerhozasib ; and the displacement of power means processes which have different layout and specifications. Implementation of the first path is provided mainly specialized harvesters displacement machine and tractor units on the basis of MEW. Implementation of the second path is provided by the introduction of the combined machine and tractor units that are designed to perform a single pass several manufacturing operations. With this combination of combined operations with different levels of energy MEW, which allows more efficient download enerhozasib and abandon units, which are necessary to create power means other characteristics.

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Fig. 3. Typical representatives of power means enhanced classic layout: a - tractor John Deere (series 6000-8000); b - Tractor Fendt-936 Vario; in - tractor HTZ-21042; g - tractor Belarus-3022; d - Tractor VC-170; e - Tractor K-3000ATM.

To create these units with power means the classical scheme and began steering wheels fitted bridge girder type, which can withstand higher loads, and according to them and wheels with tires larger sizes, which, in some cases, adversely affected the quality of shunting power means by reducing the angle of rotation controlled wheels. The latter led to the introduction in some models of tractors combined method of rotation, which is sometimes called "Superrul" [7], where the combined rotation of the steering wheels and steering wheels pidvorot axis - Fig. 4.V some models thus turning power means allowed to receive the total rotation angle of the steering wheels within 68 ° and this way significantly reduce power means turning radius, improving its quality shunting.

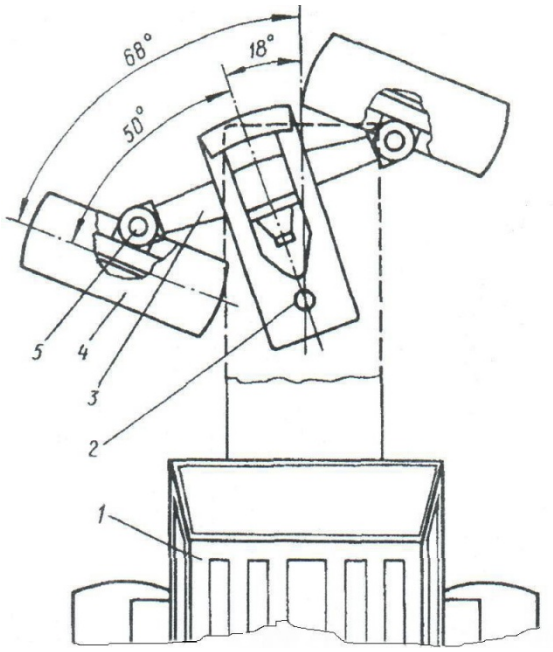
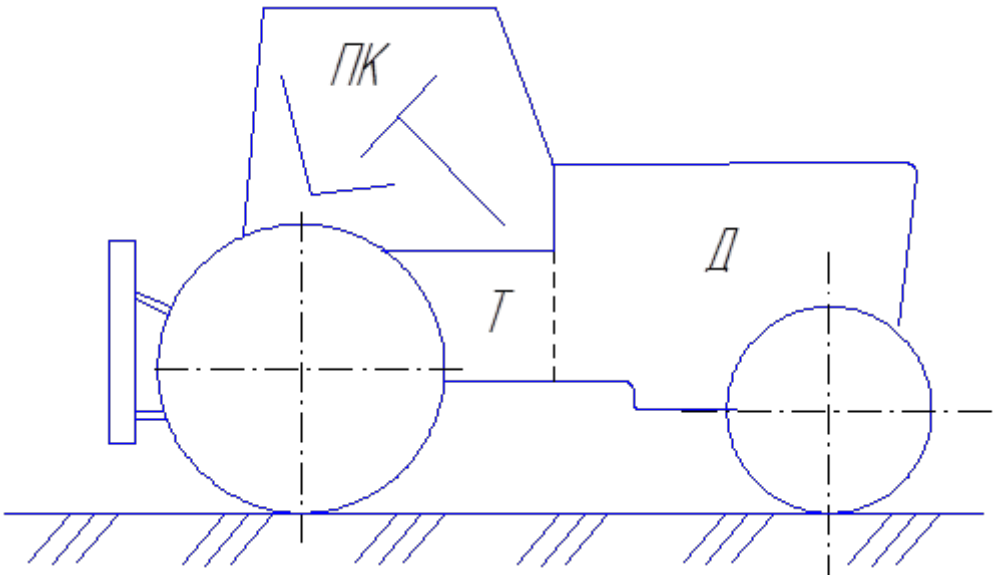


Fig. 4. Scheme steering "Superrul" tractors "Fiatahri" series G 170/240: 1 - frame power means; 2 - hinge axis of rotation of the steering wheels; 3 - Bridge steering wheels; 4 - wheel 5 - bolt.

Combining operations needed to expand the number of seats installation process machinery and equipment and other equipment that has led to the appearance of the front and side hinged devices and PTO shaft. beveled hood, relocation of some units of the power plant and transmission and so on. As a result of these paths based on the classic power means structurally Layouts units were created for different purposes and layout - Fig. 5.

All mentioned above MEW relating to classical design-layout scheme despite the fact that they can perform quite different number of process operations (provided the guaranteed support of technological modules) with different levels of quality. Such opportunities MEW taken into account in the study of levels of versatility.

Fig. 5. Units at the MEW classical design-layout scheme.



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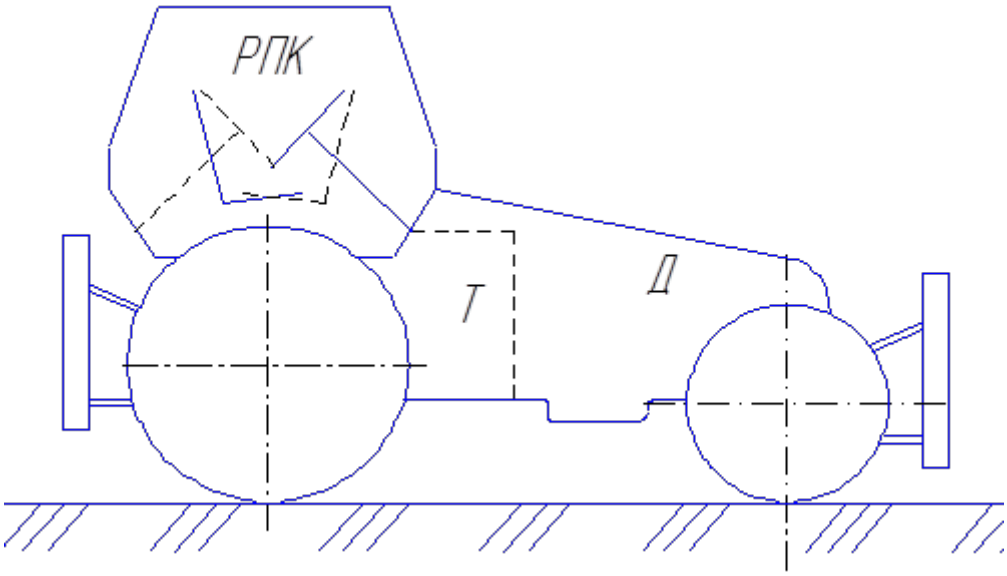

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Fig. 6. Classical design-layout scheme MEW and priorities stages of its development: a - rear-post control, not reversible control post without reversing transmission; b - reversing position control; D - engine; T - transmission; PC - post control; PKK - reversing position control.

According to the results of [8] found that tractor PMP-8280 is characterized by the level of universality Cook = 0.43 for enerhozasibu New Holland Ford 8870A Cook = 0.56, and for Fendt Favorit 924 Vario *Cook* = 0.69. The maximum value of the named parameter for classical design-layout scheme based on modern technology development and agriculture tractor-sky spodar production does not exceed 0.80. In the modern technological processes adopted for implementation in Ukraine [9] of flexibility classic design power means structurally Layouts used at

25-30% [10]. Under these conditions it is possible to identify the main directions of development of an integrated design-power means Layouts - Fig. 6. It should be noted that further structural changes within the studied layout will not significantly increase the level of universal power means, and you should analyze the prospects for their implementation in other structurally Layouts power means.

Thus it can be argued that power means klasychnoyiyi layout, in accordance with the consumer, may in a wide range of characteristics change their consumer as to achieve the universality of design Cook = 0.80 while maximizing its value equal to 1.0 by implementing two options schemes namely: 1 - rear-post control, not reversible post control without reverse transmission, and all other signs shall comply with those set out in [1] for enhanced classic layout (Fig. 6, a); 2 - reversing position control, reversing transmission, and all other signs shall comply with those set out in [1] for enhanced classic layout (Fig. 6 B). The need for implementation of these same options should be conditional upon the needs of agriculture, in particular its readiness as technologically and technically implement incorporated in the design of the machine performance universal design.

Conclusion. As a result of studies found that in order to ensure customer requirements classical design-Layouts power means it is advisable to implement compliance with its main characteristic features improved layout and differences, which are concentrated in two versions circuit design, namely: 1 - rear-post control, not reversing position control without reversing transmission; 2 - reversing position control, reversing transmission. The feasibility of implementing these options should be conditional upon the needs of agriculture, in particular its readiness as technologically and technically implement incorporated in the design of the machine performance universal design.

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Results analysis Yzlozhenы development klassycheskoy structurally komponovochnoy scheme эnerhosredstv selskohozyaystvennoho purpose.

Mobylnыy эnerhetycheskoe funds, configuration, Classical arrangement, constructions, development.

The results of analysis of development of classical design-layout scheme of power unit for agricultural purposes.

Mobile energy facility, layout, classic layout, design, development.