WAYS OF MODERNIZING EARTHWORK MACHINERY BASED ON WHEELED TRACTORS MANUFACTURED "KHARKIV TRACTOR PLANT"

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Improving technical and operational efficiency of wheeled machinery, which is made on the wheeled tractor basis, during performing such specialized engineering and construction works as excavation, loosening, distribution, compaction of land, as well as for work on digging trenches, small pits, laying ditches and trenches. It is impossible to bypass the complex operation issue of the "engine-transmission-technological process" system while implementing the design solutions of the transmission unit structure because performance indicators improvement for wheeled machine, is achieved by the combined investigation of all power unit components.

One of the ways to modernize a specialized earthmoving machine based on a wheeled tractor of the "КНТР" (АТ «ХТЗ») is to introduce a two-flow stepless hydraulic-volumetric mechanical transmission instead of a classic step-by-step mechanical transmission. Such modernization should take into account the entire range of loads from technological works, in particular specialized engineering and construction works, as well as comply with the technical requirements of the prototype with a PZM-2 (ПЗМ-2) mechanical transmission:

- digging a trench with a depth of 1.2m and a width at the bottom of 0.6m;
- digging pits with a depth of 3m and a width along the bottom of 2 ÷ 3.5m;
- technical productivity when digging pits should be 140 m^3/h, in thawed soil - 180 m^3/h, in frozen soil - 35 m^3/h.

The worldwide transition from mechanical to continuously variable transmissions in the field of tractor construction is associated with the development of modern technologies, which prompts the creation of means of power transmission from the power unit to the propulsors. Stepless two-flow hydraulic-mechanical transmission is especially widespread for wheeled tractors. This trend of introducing hydraulic-volumetric-mechanical transmission is primarily connected with a range of advantages. The feasibility of stepless two-flow transmissions, which is emphasized by the advantages compared to step mechanical transmissions, are:

- stepless transmission of power from the internal combustion engine to the wheels, which ensures smooth movement from a standstill;
- high compactness, small weight and overall dimensions due to the decreased number of shafts, gears, couplings and other mechanical elements;
- the possibility of complex braking by hydrovolume transmission (hydraulic machines parameters change) and standard brake system significantly increases the efficiency and reliability of the brake system;
- fast and symmetrical reverse;
- better automated, compared to step-by-step mechanical transmissions;
- ergonomic performance increase during technological operations;
- traversability increase due to continuous power flow and smooth torque change.