I. O. TARAN, I. YU. KLYMENKO

RESULTS OF STUDIES OF KINEMATIC AND POWER PARAMETERS OF TRANSMISSION FOR MINE DIESEL LOCOMOTIVE WITH DIFFERENTIAL AT OUTPUT

National Mining University, 19, Dmitriy Yavornytskyi Avenue, 49000, Dnipro, Ukraine; e-mail: taran_70@mail.ru,

The work is devoted to the problem of a complex study of variations in the power, kinematic and energy parameters of a hydrostatic mechanical transmission "with a differential at output" during its operation in traction and transport ranges of diesel mine locomotive running. Values of the basic transmission parameters, namely the maximum speed of the diesel-electric locomotive, the maximum angular velocity of the shaft of a hydraulic motor and a hydraulic pump, the maximum value of the transmission efficiency, and the maximum working pressure drop in the hydrostatic transmission, are obtained by the solution of a set of the algebraic equations. A peculiarity of the static model under consideration is that the calculation is carried out using the two values of angular velocities of shafts of hydraulic machines and the current and preceding working pressure drops in the transmission, resulting in an accurate determination of all of the kinematic, power and energy parameters of the transmission. Each parameter is determined until the value of the parameter under consideration at the preceding iteration becomes equal to the current value. The results obtained will be used in the determination of the reference data to simulate breaking the diesel mine locomotive.

1. *Taran I. O.* Scientific justification of new technical proposals for improving diesel mine transmission. Zbirnyk Naukovykh Prats NGU. 2015. Issue 46. P. 104 – 115.
2. *Taran I. A., Klimenko I. Yu.* Innovative mathematical tools for comparative analysis of transmissions of transportation facilities. Naukiovyi Visnyk NGU. 2014. No 3. P. 76 – 82.
3. *Taran I.* A. Interconnection of circular transmission ratio of two-flow transmission and control parameter in case of planetary gear at output. Naukovi Notatky. 2012. Issue 37. P. 316 – 320.
4. *Taran I.* A. Interconnection of circular transmission ratio of two-flow transmission and control parameter in case of planetary gear at output. Naukovyi Visnyk NGU. 2012. No 3. P. 78 – 85.
5. *Bondarenko A. I.* Comparative analysis of results of experimental and theoretical investigations into operational processes through hydrostatic power transmissions. Naukovi Notatky. 2015. Issue 48. P. 28 – 35.
6. *Samorodov V. B., Udod I. V., Derkach O. I.* Comparison of the two stepless hydrostatic power two-flow transmissions for crawler tractor. Visnyk NTU "KhPI". 2012. No 19. P. 47 – 52.
7. *Gorodetskiy K. I., Mikhaylin A. A.* Mathematical model of hydrostatic machines. Vestnik Mashinostroenia. 1981. No 9. P. 14 – 17.