

---

# COMPARATIVE ANALYSIS OF HYDRAULIC DRIVE DIAGRAMS WITH THROTTLE REGULATION

M.S. Antonov  
N.A. Egorkina

msantonov11@mail.ru  
negorkin@bk.ru

Bauman Moscow State Technical University, Moscow, Russian Federation

---

## Abstract

*We consider various kinematic diagrams of a hydraulic drive with throttle regulation. We estimated energy losses and computed full energy conversion efficiency values for various diagrams. We suggest a way to refine the diagram that makes it possible to decrease energy losses and increase full energy conversion efficiency of a hydraulic drive. We supply comparative dependencies of operational characteristics and full energy conversion efficiency for various diagrams of hydraulic drives with throttle regulation. We use mathematical models to estimate dynamic performance and transient processes for a hydraulic actuator with throttle regulation. We reveal primary advantages and a disadvantage of the refined diagram*

## Keywords

*Hydraulic actuator, throttle regulation, dynamic performance, transient processes, mathematical model*

© Bauman Moscow State Technical University, 2017

---

## References

- [1] Nikitin O.F. *Gidravlika i gidropnevmoprivod* [Hydraulics and pneumatic drive]. Moscow, Bauman Press, 2012. 430 p.
- [2] Andreev M.A. *Matematicheskoe modelirovanie gidroprivoda* [Math simulation of pneumatic drive]. 2017, 61 p. Available at: <https://drive.google.com/file/d/0B5epsjcum0RvQ080a3lvYnZPRIE/view> (accessed 01 May 2017).
- [3] Nikitin O.F. Computational method for powerful non-adjustable volume hydraulic drive with several volume hydraulic motors. *Vestnik MGTU im. N.E. Baumana. Ser. Mashinostroenie* [Herald of the Bauman Moscow State Technical University. Ser. Mechanical Engineering], 2016, no. 1, pp. 89–100.
- [4] Popov D.N. *Dinamika i regulirovanie gidro- i pnevmosistem* [Hydro and pneumatic system dynamics and regulation]. Moscow, Mashinostroenie publ., 1987. 464 p.

**Antonov M.S.** — student, Department of Fluid Mechanics, Hydraulic Machines and Hydraulic and Pneumatic Automation, Bauman Moscow State Technical University, Moscow, Russian Federation.

**Egorkina N.A.** — student, Department of Fluid Mechanics, Hydraulic Machines and Hydraulic and Pneumatic Automation, Bauman Moscow State Technical University, Moscow, Russian Federation.

**Scientific advisor** — O.F. Nikitin, Cand. Sc. (Eng.), Assoc. Professor, Department of Fluid Mechanics, Hydraulic Machines and Hydraulic and Pneumatic Automation, Bauman Moscow State Technical University, Moscow, Russian Federation.

---