On determining the lubricant film thickness for solving tribological problems

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One main task of modern domestic and foreign engineering is to improve the reliability and durability of the wheeled, tracked, hoisting-and-conveying vehicles, aircraft and space technology. The structure of these machines includes the transmission consisting of the engine, cylindrical, conical, planetary and wave gears. The article discusses the research of changing the thickness of the oil film in a heavily loaded contact by modeling the gear operation using a roller analogy. Nomograms, considering the assumptions of the contact-hydrodynamic theory of lubrication and allowing for the total rolling velocity, maximum Hertzian contact stress, relative radius of contacting surface curvature, the sliding velocity of contacting surfaces were constructed on the friction machine on the basis of performed experiments. The resulting nomograms allow reducing the costs of design, performing full-scale experimental research, and in the future taking into account this methodology in computer-aided design of gearings and friction units.

Keywords: *reliability and durability of the machine, transmission, gears, lubricant, modeling using a roller analogy.*

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