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# Analysis of service life of electromechanical drive gear mechanisms

© G.A. Timofeev<sup>1</sup>, S.I. Krasavin<sup>1</sup>, P.N. Silchenko<sup>2</sup>

<sup>1</sup>Bauman Moscow State Technical University, Moscow, 105005, Russia

<sup>2</sup>Siberian Federal University, Krasnoyarsk, 660041, Russia

*Electromechanical drives with gear mechanisms (often reducers, rarely - multipliers) are used in many space, aviation and defense facilities. In the process of long-term work (more than 10 thousand hours) the gears gradually wear out, which ultimately leads to a change in the teeth profiles, their dimensions and the appearance of increased gaps in meshing. This results in a reduction in efficiency, reduced kinematic accuracy and torsional rigidity of the drive, increased dynamic loads. The intensity of wear can vary over a wide range of values, it depends on the type of conjugated surface contact interaction, materials, environmental conditions, the nature of mechanical and chemical processes occurring in the contact, the magnitude of the acting stresses, sliding speed and ambient temperature. In friction at ordinary atmospheric conditions, films of oxides and adsorbed substances are formed on the exposed wear (interacting) surfaces reducing the intensity of wear, since being broken when sliding, they block the material destruction in a thin surface layer. A technique is proposed for calculating the service life of the electromechanical drive forehead gears by the wear criteria.*

**Keywords:** *electromechanical drive, gear mechanism, wear of teeth, service life, efficiency, kinematic accuracy, torsional stiffness*

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**Timofeev G.A.**, Dr. Sc. (Eng.), Professor, Head of the Department of Theory of Mechanisms and Machines, Head of the Scientific and Educational Complex “Robotics and Complex Mechanization”, Bauman Moscow State Technical University. Author of over 200 research publications in the field of designing and computer aided design of lever, cam, gear, planetary and wave mechanisms for various machines, devices, stands and devices, research, development and creation of planetary and wave mechanisms for high-precision tracking systems. e-mail: [timga@bmstu.ru](mailto:timga@bmstu.ru)

**Krasavin S.I.**, Cand. Sc. (Eng.), Assoc. Professor, Department of Principles of Machine Design, Bauman Moscow State Technical University. Author of over 40 research publications in the field of research of friction and lubrication processes in high-pressure contact. e-mail: [krasavin2002@rambler.ru](mailto:krasavin2002@rambler.ru)

**Silchenko P.N.** (b. 1947), Dr. Sc. (Eng.), Professor, Corresponding Member of the Academy of Astronautics. Professor of the Department “Applied Mechanics”, Siberian Federal University, (Krasnoyarsk). Author of 196 publications, including 22 copyright certificates and patents, has developed 12 computer programs. Specializes in the field of dynamics and strength of spacecraft mechanical systems.

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