

Documents

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Lubrication systems for spacecraft attitude control elements

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Abstract

Spacecraft regardless of size, type and purpose, usually contains a number of moving mechanical systems (MMS). Continual performance of these systems only can guarantee the intended functions that are essential for successful operation of the spacecraft. Most of the problems encountered with these moving systems are pertain to tribology. Space tribology is a subset of the lubrication field dealing with the reliable performance of satellites and spacecraft including the space station. Lubrication of space system is still a challenging task before the tribologists due to the unique factors encountered in space such as near zero gravity, hard vacuum, weight restriction and attention free operation. Ever since the space exploration, a number of mission failures reported emanate from bearing system malfunction. A bearing in a moving mechanical assembly can fail due to multiple reasons such as degradation of lubricant, loss of lubricant from the working zone by surface migration and evaporation, and retainer instability. Unlike yester years, space missions of today are planned to last for 30 years or more. To achieve such long-term missions, tribologically efficient moving mechanical systems are essential. This chapter briefs space tribology, tribological requirements of spacecraft moving mechanical systems and various lubricant supply systems designed for high speed MMS. © 2012 by Nova Science Publishers, Inc. All rights reserved.

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