

## Documents

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**A bearing cartridge assembly for long-term performance of momentum/reaction wheels used in spacecraft**

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**Abstract**

Momentum/reaction wheels are used in a spacecraft for the attitude control. They are used for the real time control of spacecraft attitude towards the desired direction as required by the mission. These are one of the few systems of a spacecraft which need to work continuously from the beginning to end of the mission. Thus the life of a space mission depends largely on the performance of the attitude control wheels. The common mode of failure in momentum/reaction wheel is mechanical and mostly related to the bearing and lubrication. This paper presents the design and development of a bearing cartridge assembly including the lubrication system for long-term performance of spacecraft attitude control wheels. The results of both theoretical and experimental analysis are presented. The experimental study of the assembly shows that it can perform continuously for a period of 30 years with reduced frictional losses. © 2014 Published by Faculty of Engineering.

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