

Module Based Review over Current Regenerative Braking Landing Gear

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Abstract : As energy efficiency is the key concern in many aircraft manufacturing companies regenerative braking is a technique using which energy lost due to friction while braking can be regained. In the operation of an aircraft, significant energy is lost during deceleration or braking which occurs during its landing phase. This problem can be overcome using Regenerative Braking System (RBS) in landing gear. The major problem faced is regarding the batteries and the overall efficiency gained in competence with the added weight. As the amount of energy required to store is huge we need batteries with high capacity for storage. Another obstacle by using high capacity batteries is the added weight which undermines the efficiency obtained using RBS. An approach to this problem is to either use the obtained energy immediately without storage or to store in other forms such as mechanical, pneumatic and hydraulic. Problem faced with mechanical systems is the weight of the flywheel needed to obtain required efficiency. Pneumatic and hydraulic systems are a better option at present. Using hydraulic systems for storing energy is efficient as it integrates into the overall hydraulic system present in the aircraft. Another obstacle is faced with the redundancy of this system. Conventional braking must be used along with RBS in order to provide redundancy. Major benefits obtained using RBS is with the help of the energy obtained during landing which can be used of engine less taxing. This reduces fuel consumption as well as noise and air pollution. Another added benefit of using RBS is to provide electrical supply to lighting systems, cabin pressurization system and can be used for emergency power supply in case of electric failure. This paper discusses about using RBS in landing gear, problems, prospects and new techniques being pursued to improve RBS.

Keywords : regenerative braking, types of energy conversion, landing gear, energy storage

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