Abstract

Gear is a vital and inevitable component in a machine. It is been a subject of research from the very first day of development of gear that, how to minimize gear failure? Many researches have already been done on the improvement of gears' stress carrying capacity. When a pair of gear meshes with each other, failure occurs due to cracks generated at the region of undercut caused by bending stress. Bending stress can be minimized by introducing a stress reliving feature on the gear surface. In few machines like Helicopter and Airplane gears are mainly used for forward rotation. In asymmetric gear one of the curved surfaces where engagement with other gear takes place is kept larger than the not mating curved surface. The curved surface where mating takes place with other gear is called drive surface and the curved surface where mating does not takes place is called coast surface. So, a smaller asymmetric gear transmits same torque transmitted by a larger symmetric gear and thus it is useful for aviation vehicle where weight of the vehicle is very important. In this work the above mentioned fact that, an asymmetric gear transmits same torque transmitted by a larger symmetric gear, has been proved by comparing bending stress carrying capacity by a symmetric gear and an asymmetric gear. The bending stress carrying capacity is calculated in ANSYS by structural analysis of the gear tooth under a given loading condition. The load value and gear geometry parameters have been taken loading condition mentioned in reference [17]. In the present work
ANSYS has been used as a FEA software and 3-Dimensional model of the gear geometry has been considered. The bending stress thus found out for symmetric as well as for the asymmetric gear tooth.

References

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Index Terms

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Keywords

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