Determination of Natural Frequencies of Spur Gear in Portal Axle Gearbox

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Portal axle is introduced to avoid damage of the vehicle bottom portion while it is running on off-road condition by providing additional ground clearance to the vehicle. Since the ground clearance is achieved through gear train arrangement, the operating frequency of the gear shouldn’t match with its natural frequency. This work aims to predict the natural frequencies and modes shapes of the gear train with three types of gear arrangements. The effect of natural frequency also studied with three different gear materials such as steel, CI and Al alloy. Gear trains are modeled in Solidworks 2017 and analyzed in well-known FEM software ANSYS workbench 16.0. First six natural frequencies and corresponding mode shapes are also obtained. FEM results are compared with operating frequency of the gear.

***Keywords*:** ANSYS Workbench, FEM, Portal axle, Spur Gear