

# Mechanics of the Tread Pattern

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## Abstract

Pattern is one of the most important components of the tire, which plays an essential role in the performance of the tire that contacts with the road surface. The tire pattern consists of blocks, the purpose of this paper is to calculate the block rigidity. First, Shear Spring Rate of the Tire Block Pattern under shear force has been obtained by using elastic theories and beam deformations under bending moment and shear force. Then, the rigidity of the blocks under shear force and with sipe is checked by using the relationships of series and parallel springs. The effect of the number of sipe and the depth of sipe on the rigidity of the block under the shear force is investigated. It is found that the depth of sipes is important and increasing the number of sipes greatly reduces the rigidity of the block. Finally, the block rigidity which include sipes was investigated in different directions and under different angles.

**Keywords:** Tire, Pattern, block rigidity