

# Design of Freewheel Differential

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**Abstract:** *In a tricycle, achieving stability during turns and optimizing traction are critical. A conventional differential may not always be ideal due to its complexity and cost, especially in lightweight vehicles like tricycles. The sprag-type freewheel differential provides a simplified yet highly effective solution. It allows each wheel to rotate independently, accommodating speed variations during turns, and improving handling without the need for complex gears or electronic control systems. In this paper, sprag-type freewheel differential is an innovative mechanism designed to enhance the performance and manoeuvrability of tricycles. Unlike conventional fixed axle systems, this differential utilizes sprag clutches to facilitate independent wheel movement while maintaining efficient torque transfer.*

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