How Do Shock Pistons Affect the Efficiency and Ride Quality of a Shock?

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Shock absorbers are important to all transportation in the modern day. As technology advances, shock technology is advancing as well. Shocks are specially designed for the application they will be used on. This experiment is to test and determine the different shock pistons. Each piston that is tested as well as the cup, was all designed myself and 3D printed. It was hypothesized that the more holes or holes for fluid to pass through, the faster the piston would rebound and make the shock softer. My engineering goal was to make a shock absorber as efficient as possible for the application. In a 3D-printed shock cup, all three pistons were tested on the rebound from bottom to top. The cup was filled with water. One piston has two regular flow holes, another has only one regular flow hole, and the last has a rectangle hole. The regular piston measured 2.89 seconds, the single-hole piston measured 3.55 seconds, and the rectangle piston measured 1.81 seconds. The results showed there is a direct relationship between the shock piston and the shock itself. With more holes, the flow increases. The results stated that the more holes you have in a piston, the softer the shock will be, as well as more flow. Fewer holes will make the shock stiffer, as well as not allow as much flow.

Awards Won:

Missouri University of Science and Technology: $1,250 tuition scholarship (renewable for up to 4 years)

University of Texas at Dallas: Scholarship of $5,000 per year, renewable for up to four years