

# **Creating a Reciprocating Air Compressor using a Single Degree of Freedom Spring Mass Damper Resonant System**

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Theoretically, a reciprocating air compressor should work with a single degree of freedom spring mass damper resonant (1D-SMD) design. The following steps were used to demonstrate how the system could be applied to an air compressor. Once a mathematical model was created, the calculated results determined the parameters for the solid model using SolidWorks. The model included a design that was based around an off-the-shelf air compressor. These parts were either 3d printed, ordered, or machined and assembled. Finally, the system was tested as an air compressor. Several design iterations were performed to improve the system. The application of this project resulted in a newly built air compressor, which suggests this is an efficient way to compress air.