

Analysis of a Cam, Rocker and Valve System Using SolidWorks Motion Study

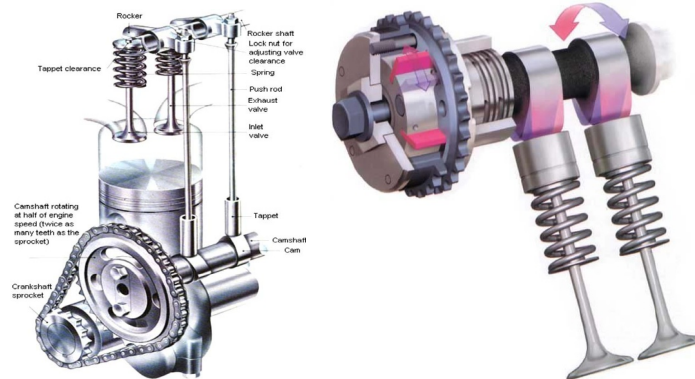
ME345: Modeling and Simulation
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Software versions used in the tutorial:
SolidWorks 2011

Introduction:

A cam-follower system is a useful tool in machine design. It is often employed when a precisely timed and positioned path of motion is desired, such as in the valve train of an internal combustion engine. In this case, the system is extended to include a cam, a rocker arm (follower), and a spring loaded valve. A cam is an oblong shape that is machined onto a shaft. When the shaft rotates, the rocker arm drags along the cam surface producing a timed rising and falling output motion. As the end of the rocker arm that touches the cam rises, the opposite end of the rocker falls, and in doing so, applies a force to the valve. The valve is usually spring loaded such that as the rocker arm rises again, so will the valve, maintaining continuous contact throughout the cycle. In this tutorial the forces applied to the rocker from the cam will be measured using Solidworks Motion Study.



Instructions:

1) Complete the **Valve Cam** tutorial, which can be found on your computer. In Solidworks go to:

Help>Solidworks Tutorials>All Solidworks Tutorials>Solidworks Motion

2) On the second page of the tutorial, click “Click here” to download the Solidworks parts.

Note: In the “**Adjusting the spring section**” of the tutorial you will be asked to enter parameters for a spring, though no values are provided. At this point you should choose values for the spring parameters that you think are reasonable. As a result, the peak values of your graphs will be different from those in the tutorial. Ignore this difference and continue on with the tutorial.