

## Effect of Design Parameters on a Two Stage Launch Vehicle Performance

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**Abstract :** Change in design parameters of launch vehicle affects its overall flight path trajectory. In this paper, several design parameters are introduced to study their effect. Selected parameters are the launch vehicle mass, which is presented in the form of payload mass, the maximum allowable angle of attack the launch vehicle can withstand, the flight path angle that is predefined for the launch vehicle second stage, the required inclination and its effect on the launch azimuth and finally by changing the launch pad coordinate. Selected design parameters are studied for their effect on the variation of altitude, ground range, absolute velocity and the flight path angle. The study gives a general mean of adjusting the design parameters to reach the required launch vehicle performance.

**Keywords :** launch vehicle azimuth, launch vehicle trajectory, launch vehicle payload, launch pad location

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