

Control surface and wing stability problems

Royal Aeronautical Society - Aerodynamics and Theory of Flight, Forces of Flight, Lift, Weight, Thrust, Drag, Generating Lift, Airfoils, Angle of Attack, Parasitic Drag, Induced Drag, Ground Effect, Boundary Layer, Stalls, Factors Affecting Aircraft Stalls, Spins, Aircraft Lift and Drag Concepts, Drag Curve, Maximum



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Factors affecting aircraft stability aerodynamics

In the , the elevators are hinged to the rear of a foreplane and move in the opposite sense, for example when the pilot pulls the stick back the elevators go down to increase the lift at the front and lift the nose up. Supersonic airflow exists in the area of maximum thickness on top of the wing, subsonic flow exists elsewhere. In this case when the airplane is in a bank and sideslipping, the side force tends to turn the plane into the relative wind.

Factors affecting aircraft stability aerodynamics

As shown in a , balance tabs are set up to move opposite and proportional to the primary control surface movement.

Control and Stability of Aircraft

An airplane of this design has poor flying qualities.

Aircraft Stability

The results of calculation and experimental investigations show that such aerodynamic configurations, thanks to positive effects of airframe-powerplant integration, allow achieving high lift-to-drag level with relatively large inner volumes. Khajehzadeh A 2018 Analysis of an over the wing based distributed propulsion system. As shown in , if the center of gravity is sufficiently forward of the aerodynamic center points A or B , then the airplane is statically stable.

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