

عنوان مقاله:

Comparative Flow Field Analysis of Boundary Layer Diverter Intake and Diverterless Supersonic Intake Configuration

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خلاصه مقاله:

In this paper comparative flow field analysis of two intake configuration i.e. Boundary Layer Diverter Intake and Diverterless Supersonic Intake is carried out based on dimensionless parameters under various flow conditions. Numerical analysis of aircraft intake is a complex phenomenon which involves both external and internal flow analysis. In this research, both external and internal flow characteristics of intake duct are analyzed in detail. A comprehensive mesh scheme is devised and implemented to accurately capture the flow behavior in external surrounding of intake duct and flow passing through the intake duct. The analysis is carried out at different flow conditions to analyze the flow behavior in subsonic and supersonic regimes. Engine design mass flow rate is used for accurate intake analysis and results are validated with available literature. Boundary layer diversion and pressure recovery are examined for each intake configuration and comparative analysis based on pressure recovery is carried out subsequently. The analysis reveals that at subsonic and transonic regimes, Boundary Layer Diverter intake is much more effective than Diverter less Supersonic Intake, however, in supersonic regime Diverter less Supersonic Intake is found be to more effective. The research can further help in modifying/ improving the design of an existing intake configuration for enhanced intake efficiency.

کلمات کلیدی:

Aerodynamics, Boundary layer Diverter intake, Diverterless supersonic intake, Pressure recovery

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