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Nomenclature; 2.9.1 Subscript; References; 3 Fuselage Design; 3.1 Introduction; 3.2 Commercial aircraft cabin volume and pressure; 3.2.1 Cabin volume; 3.2.2 Cabin pressure; 3.3 General cabin layout; 3.4 Cabin cross-section; 3.5 Estimation of fuselage width; 3.6 Estimation of fuselage length; 3.7 Influence of fuselage fineness ratio; 3.7.1 Fuselage effects on drag; 3.7.2 Fuselage effect on lift; 3.8 Estimation of nose cone and tail cone length; 3.9 Cargo containers
3.10 Emergency exits
3.11 Recent developments in fuselage design;
3.12 Design summary; References; 4 Engine Selection; 4.1 Introduction; 4.2 Landing requirements; 4.3 Wing loading in landing; 4.4 Landing field length; 4.5 Wing loading in takeoff; 4.6 Takeoff distance; 4.7 Cruise requirements; 4.8 Construction of the engine selection design chart; 4.9 Flight test data for landing and power approach; 4.10 Turbojet and turbofan engines; 4.10.1 Dual shaft turbojet; 4.10.2 Dual shaft high bypass turbofan; 4.10.3 Determination of net thrust; 4.10.4 Net thrust in takeoff; 4.10.5 Net thrust in cruise
4.10.6 Specific fuel consumption in cruise
4.11 Turboprops; 4.11.1 Takeoff distance; 4.11.2 Turboprop cruise requirements; 4.11.3 Estimating takeoff thrust and specific fuel consumption; 4.12 Engine-out operation and balanced field length; 4.13 Design summary; 4.14 Nomenclature; References; 5 Wing Design; 5.1 General wing planform characteristics; 5.1.1 The straight-tapered wing planform; 5.1.2 Cranked wing planform; 5.1.3 Wing dihedral; 5.2 General airfoil characteristics; 5.2.1 Airfoil sections; 5.2.2 Airfoils at angle of attack; 5.2.3 Airfoil selection
5.2.4 Compressibility effects on airfoils

Sommario/riassunto

Commercial Airplane Design Principles is a succinct, focused text covering all the information required at the preliminary stage of aircraft design: initial sizing and weight estimation, fuselage design, engine selection, aerodynamic analysis, stability and control, drag estimation, performance analysis, and economic analysis. The text places emphasis on making informed choices from an array of competing options, and developing the confidence to do so. Shows the use of standard, empirical, and classical methods in support of the design process Exp
