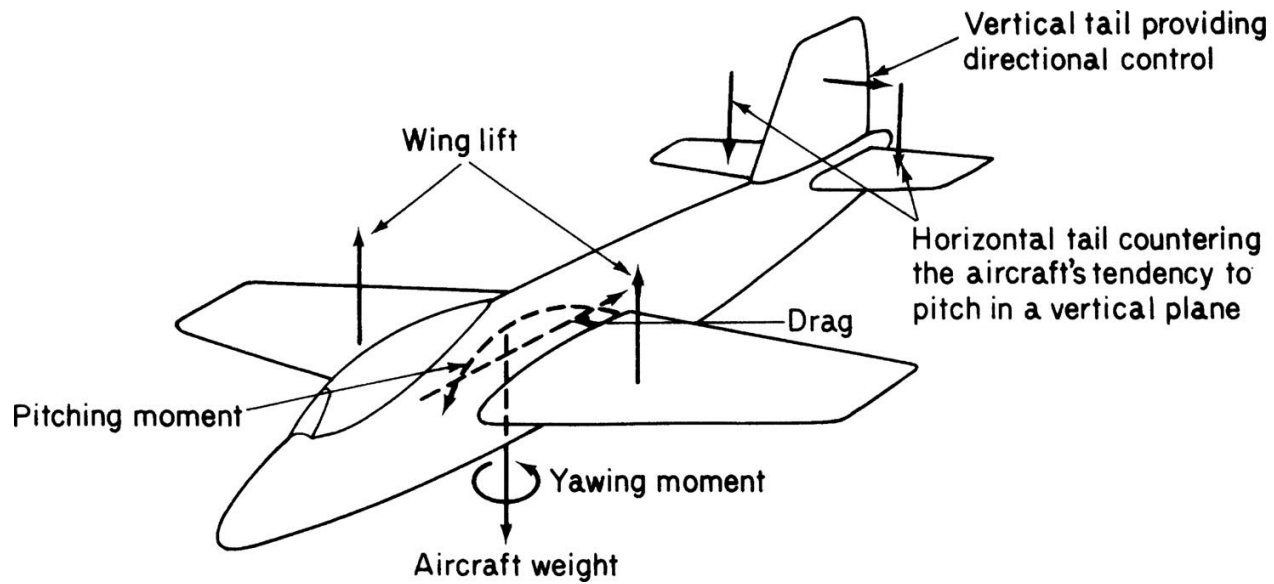
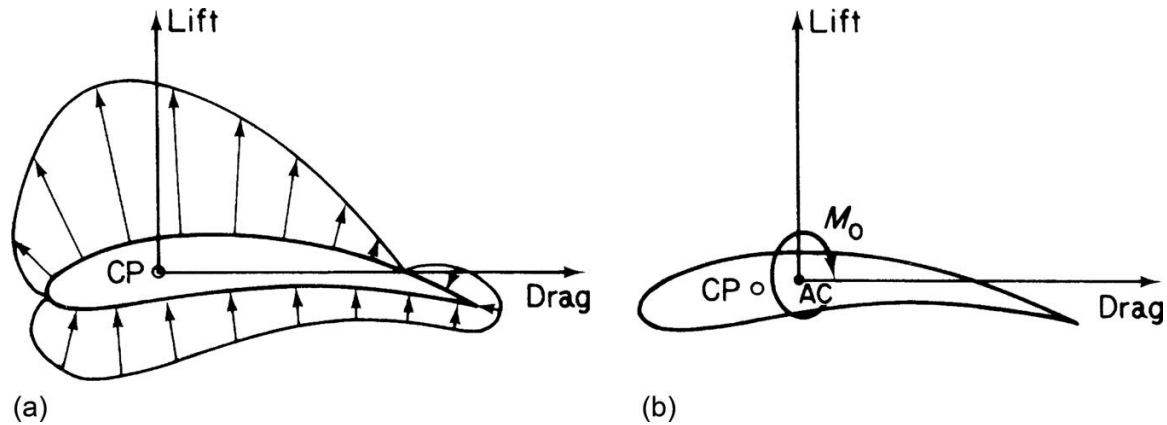


# Chapter 12

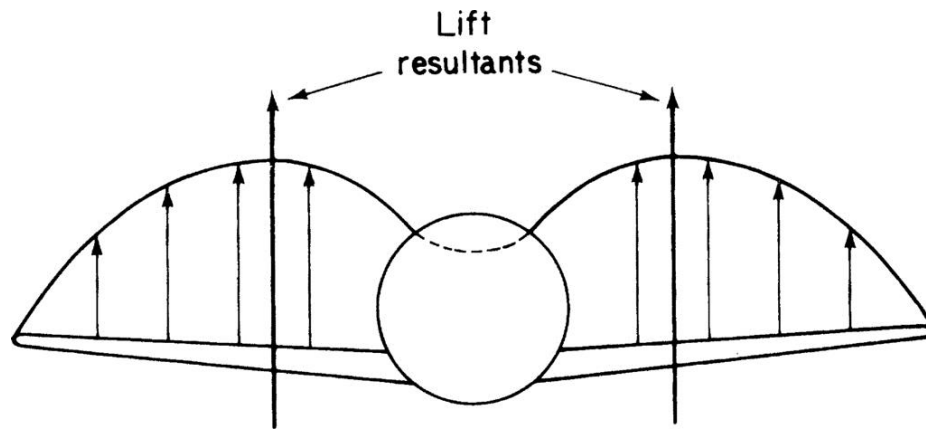
## Structural components of aircraft



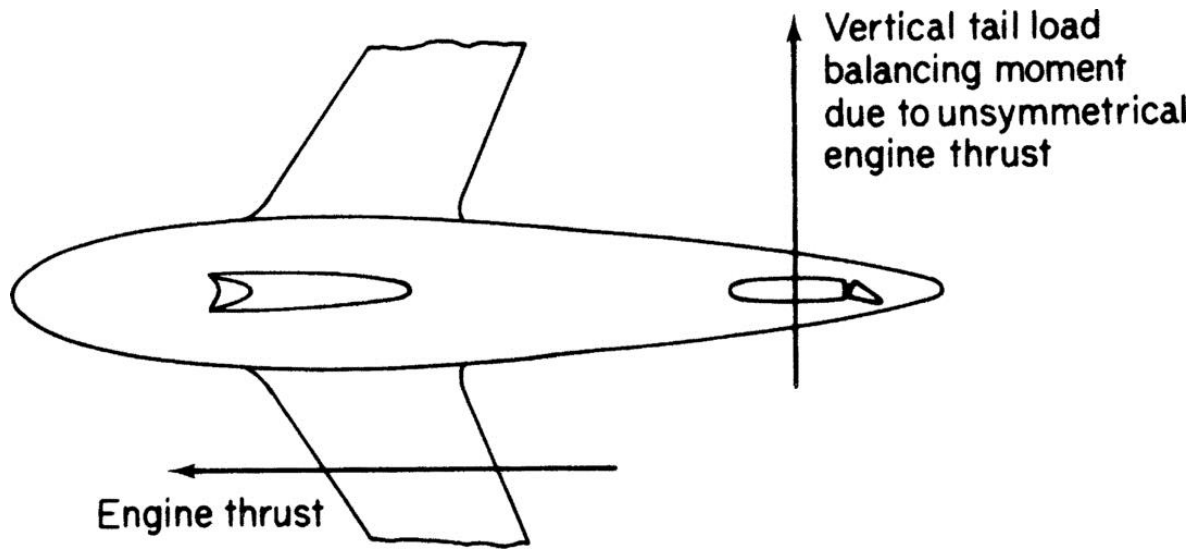
**FIGURE 12.1** Principal Aerodynamic Forces on an Aircraft during Flight



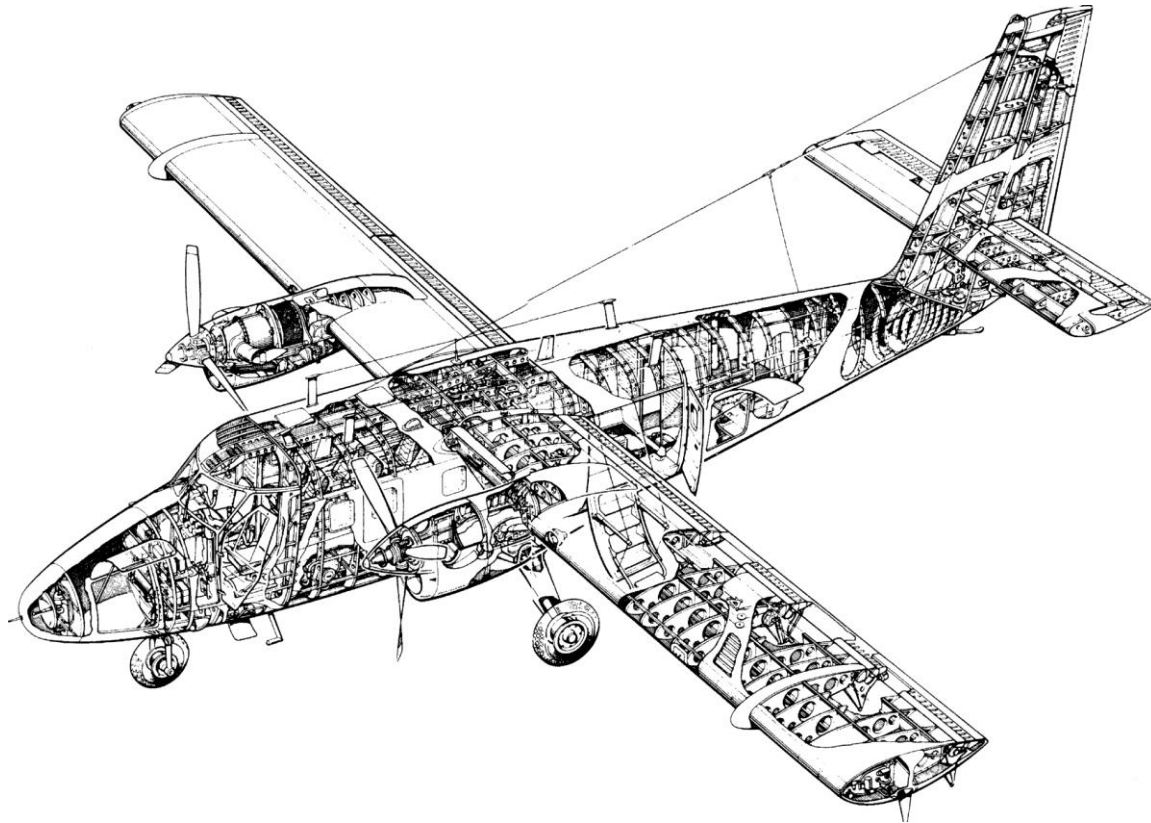
**FIGURE 12.2** (a) Pressure Distribution around an Aerofoil; (b) Transference of Lift and Drag Loads to the AC



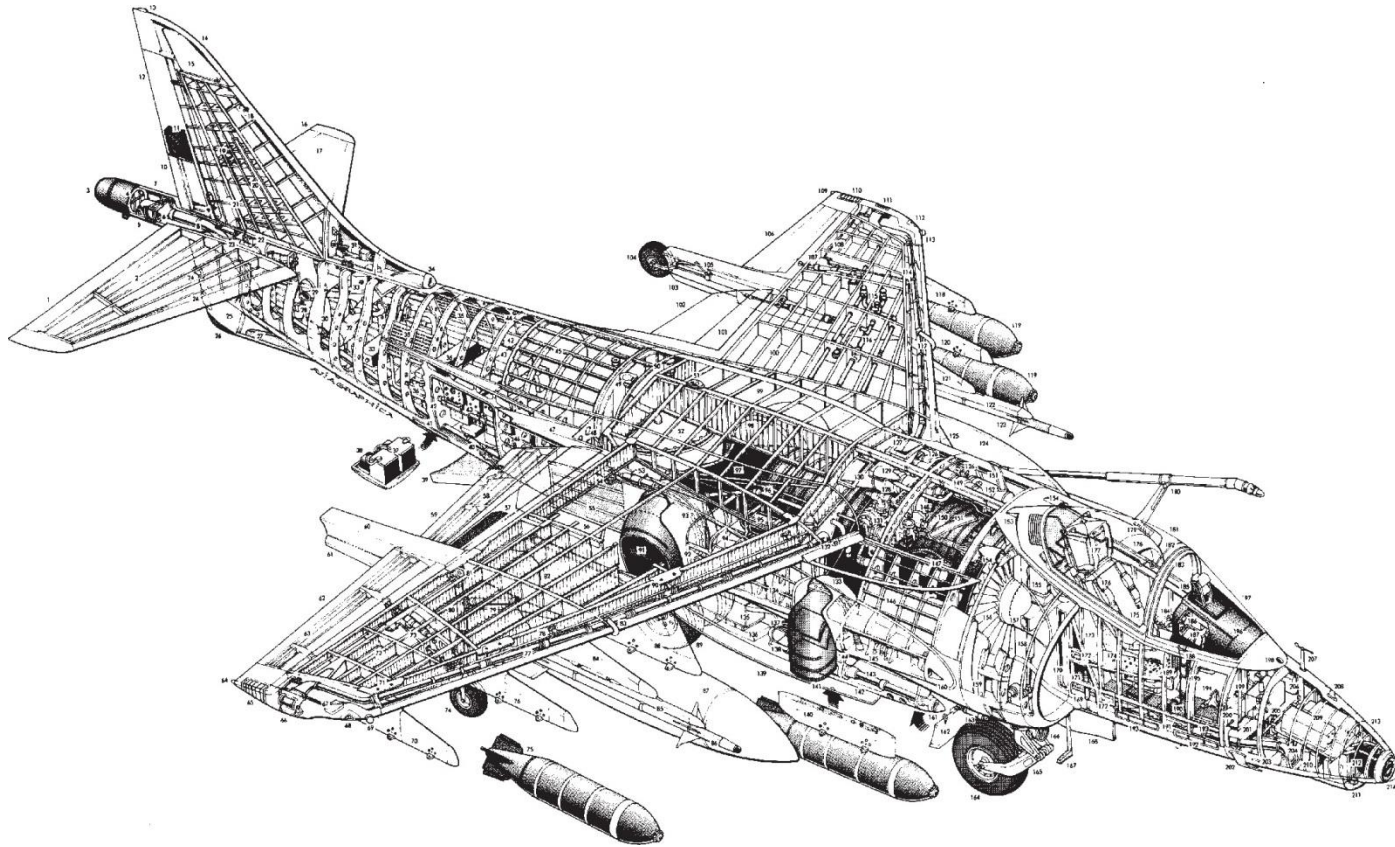
**FIGURE 12.3** Typical Lift Distribution for a Wing–Fuselage Combination



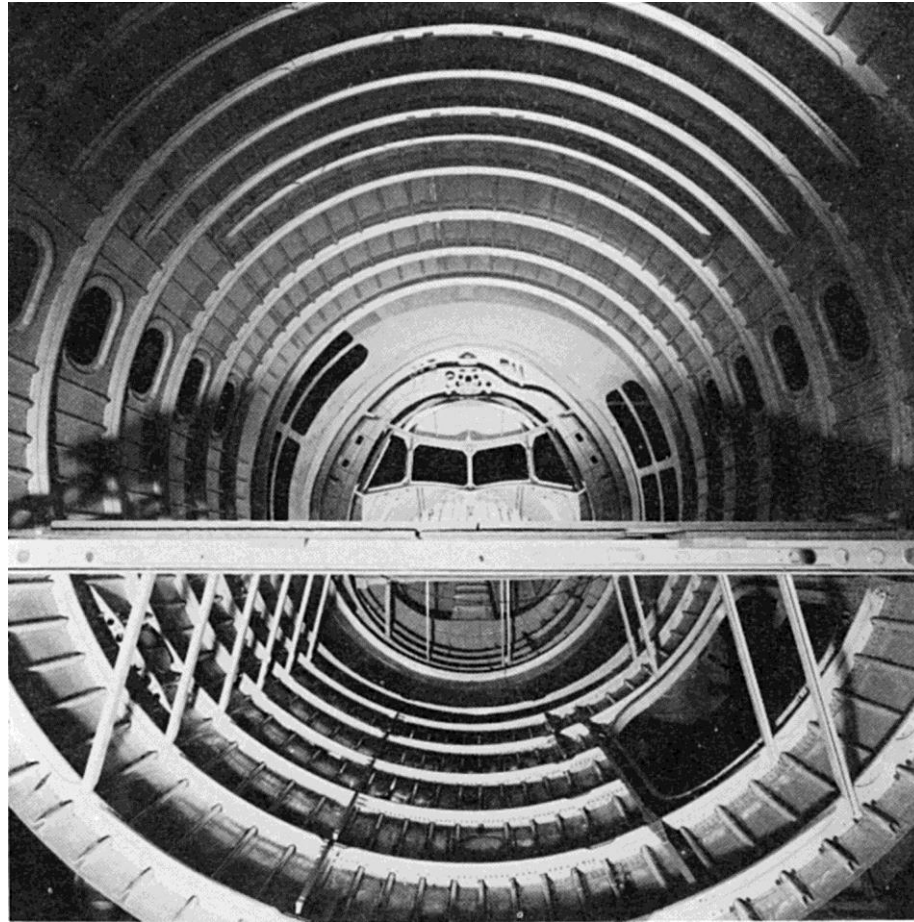
**FIGURE 12.4** Fuselage and Wing Bending Caused by an Unsymmetrical Engine Load



**FIGURE 12.5** De Havilland Canada Twin Otter

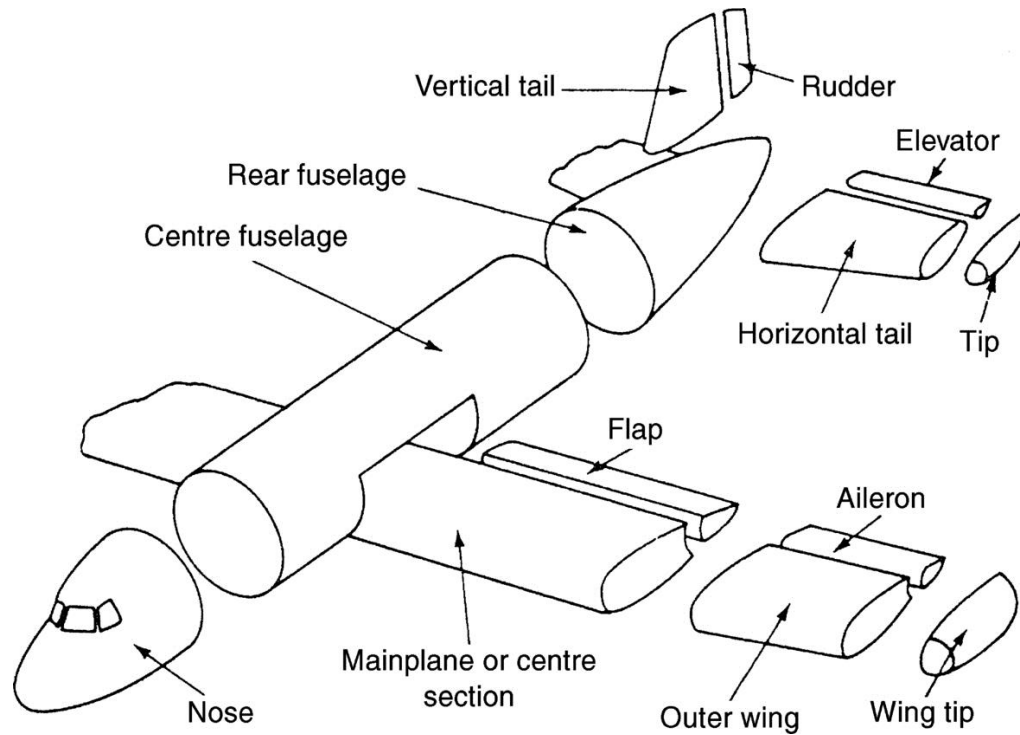


**FIGURE 12.6** Harrier



**FIGURE 12.7** British Aerospace 146

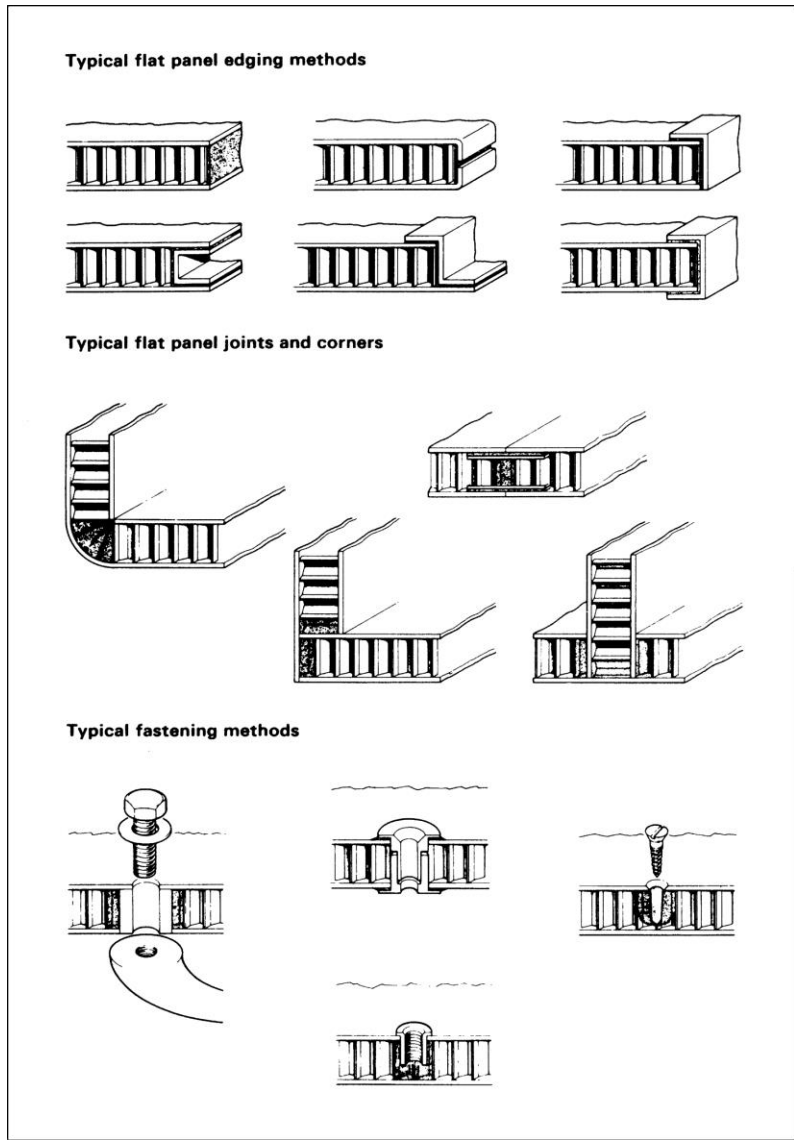




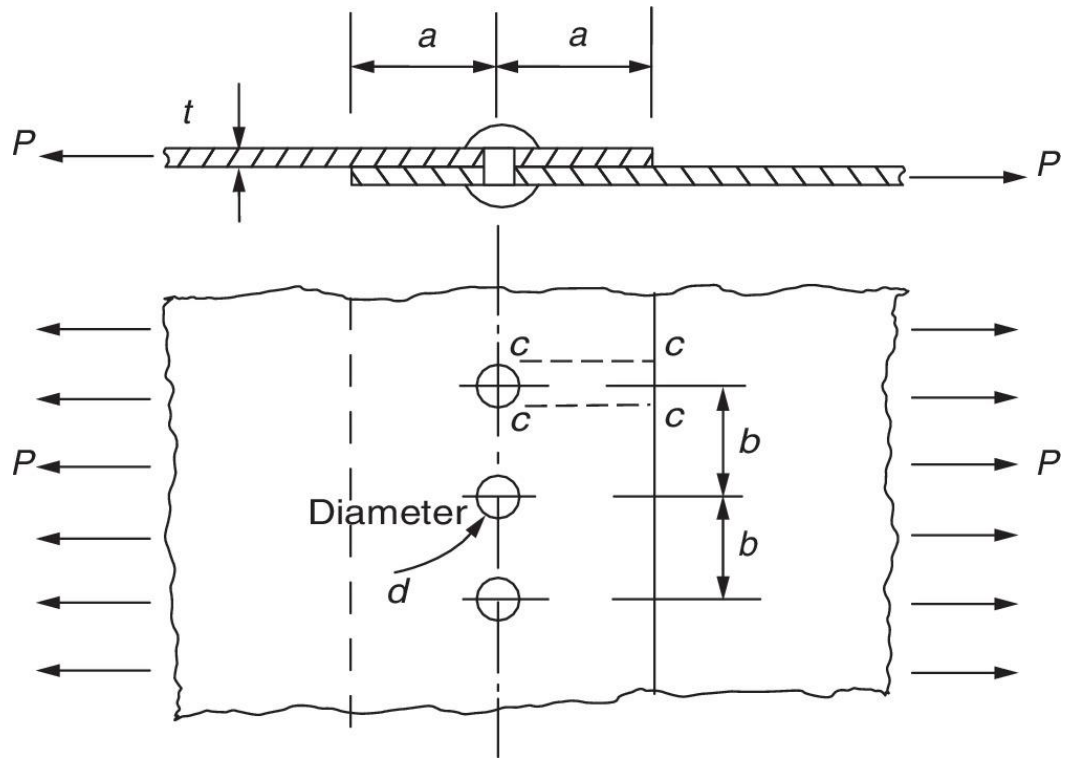
**FIGURE 12.8** Typical Sub-assembly Breakdown



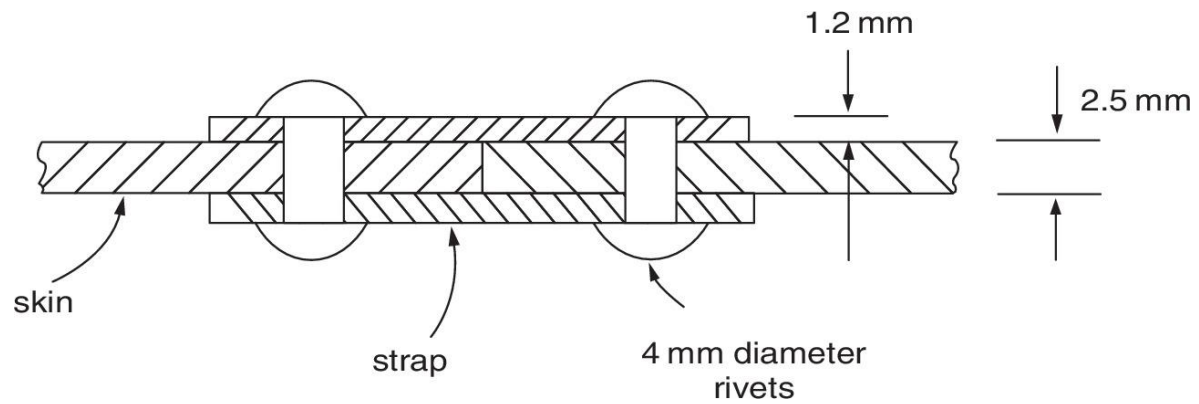
**FIGURE 12.9** Wing Ribs for the European Airbus



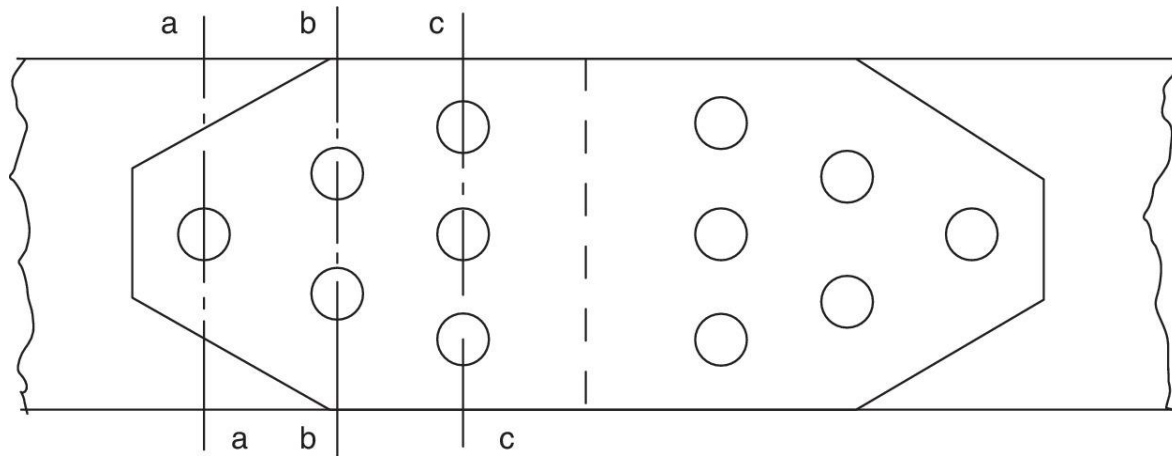
**FIGURE 12.10** Sandwich Panels



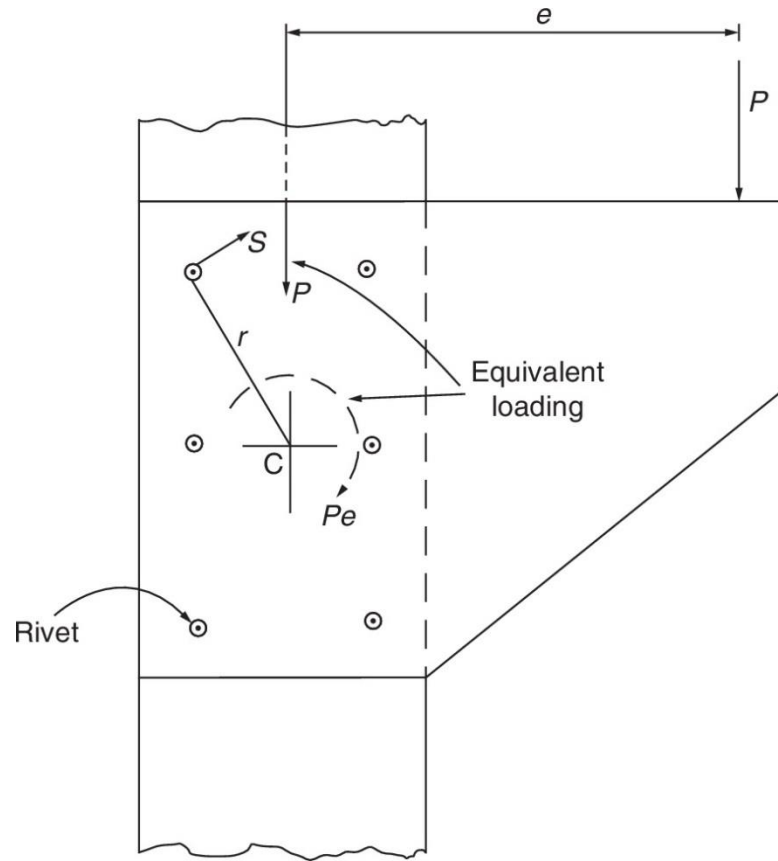
**FIGURE 12.11** Simple Riveted Lap Joint



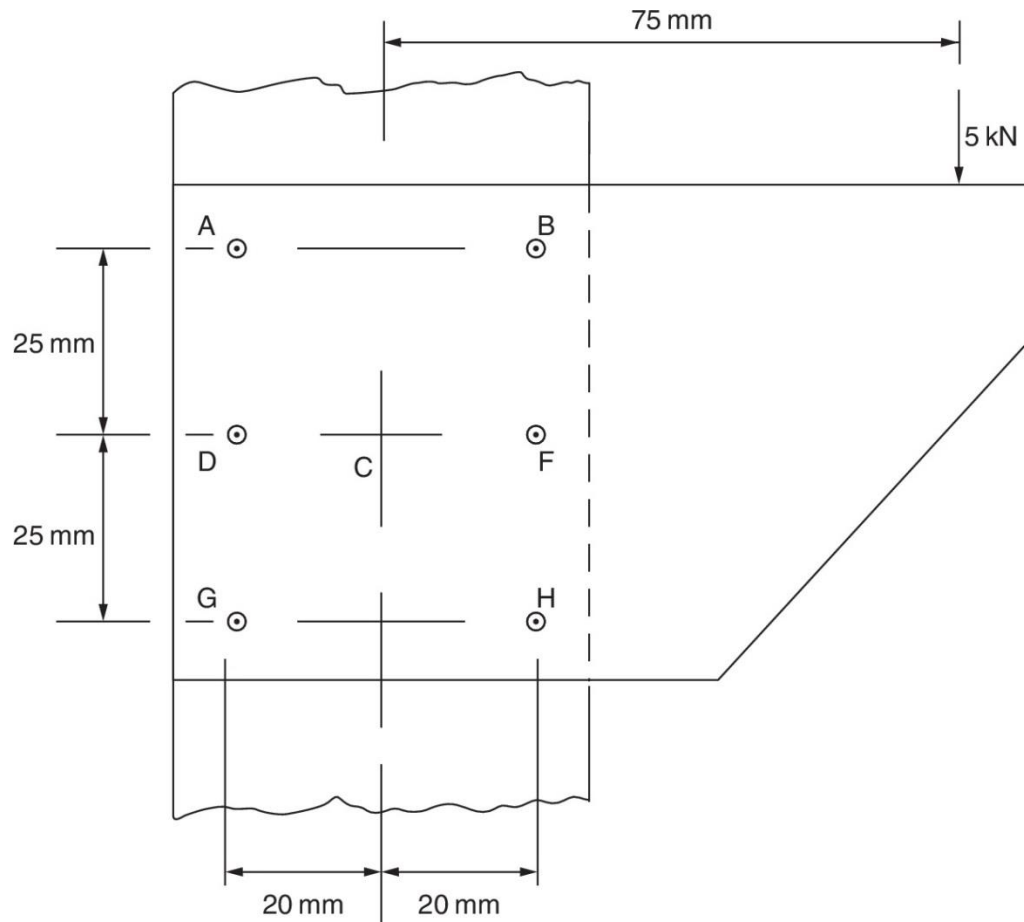
**FIGURE 12.12** Joint of Example 12.1



**FIGURE 12.13** A Group-Riveted Joint

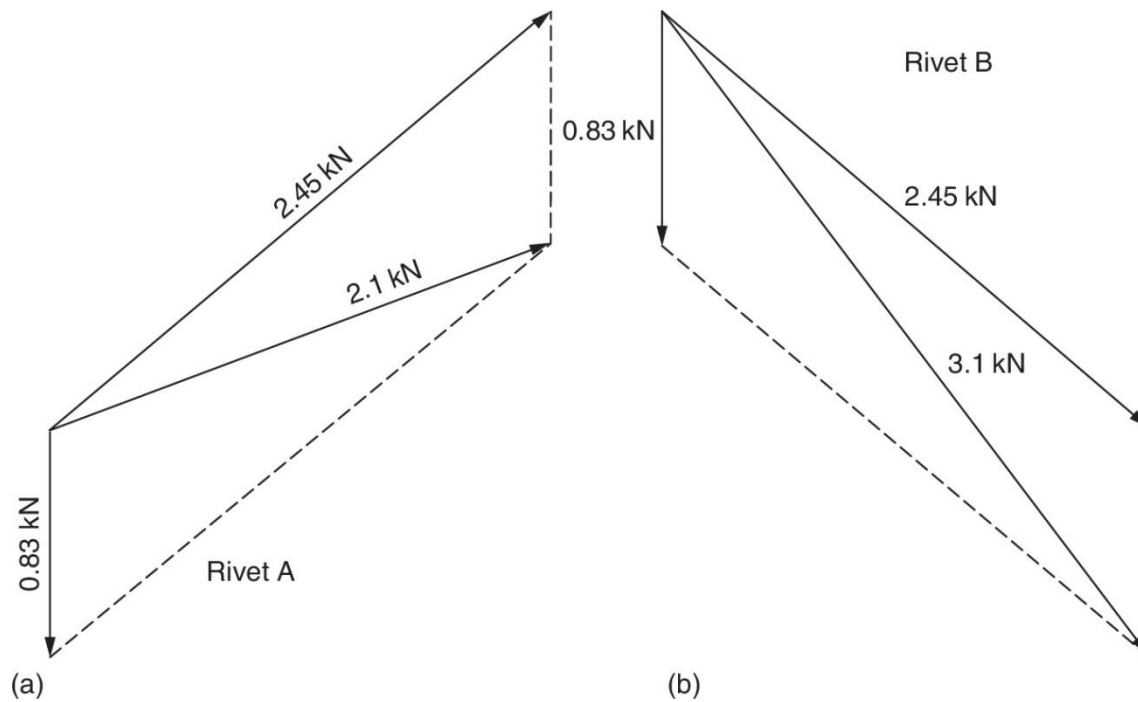


**FIGURE 12.14** Eccentrically Loaded Joint



**FIGURE 12.15** Joint of Example 12.2





**FIGURE 12.16** Force Diagrams for Rivets of Example 12.2

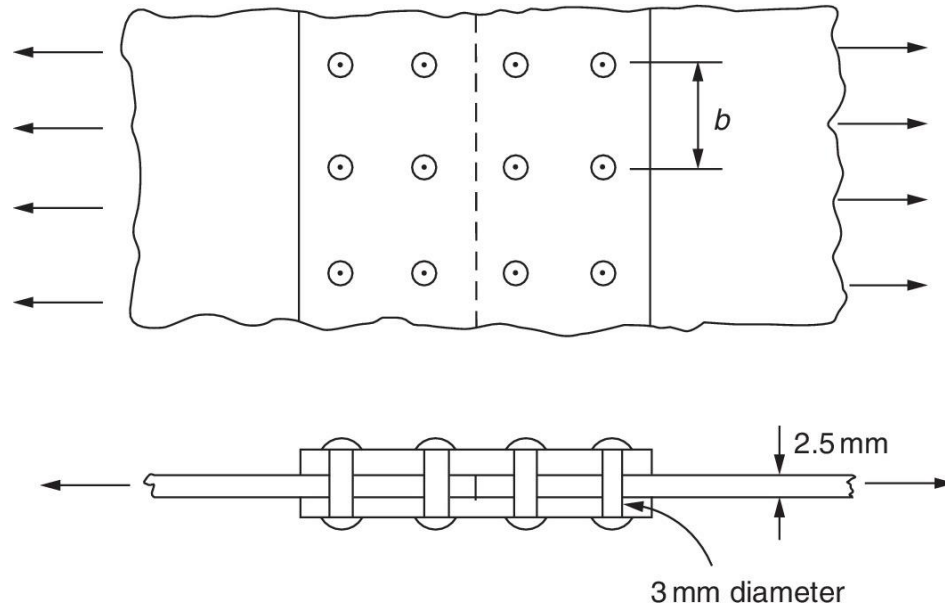


FIGURE P.12.3

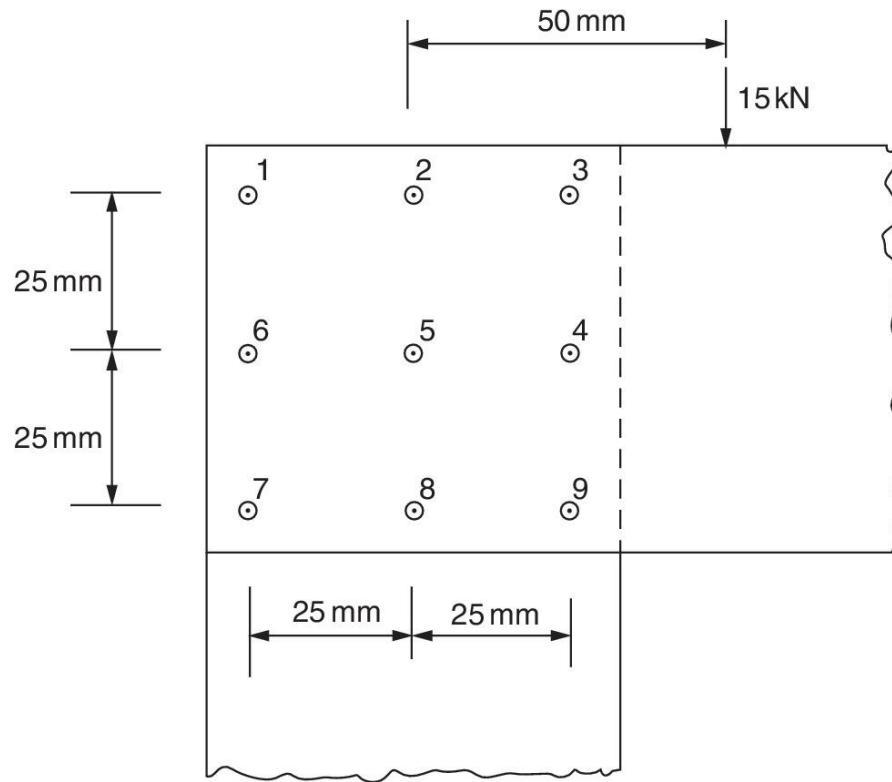


FIGURE P.12.4