

# Propeller



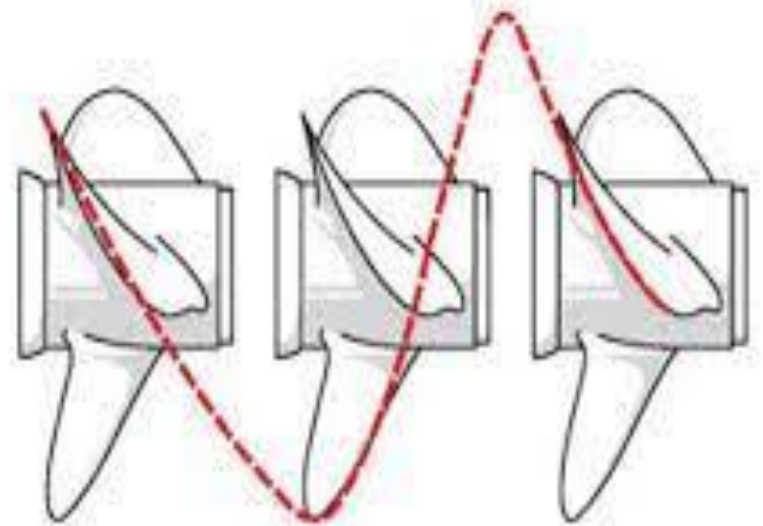
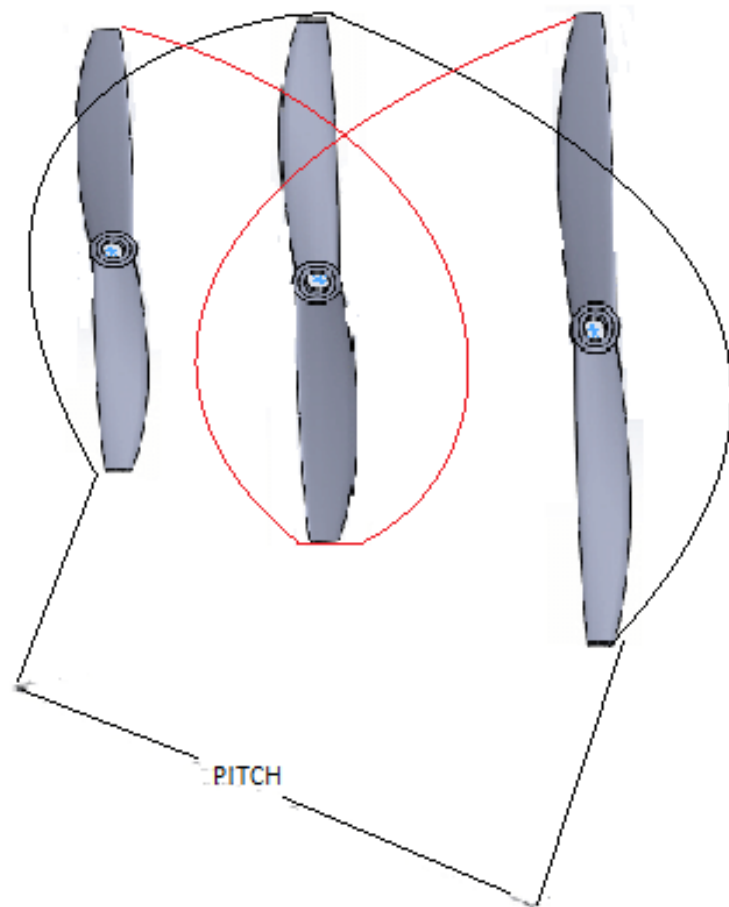
# What is the propeller ?

- A propeller is a type of fan that transmits power by converting rotational motion into thrust. A pressure difference is produced between the forward and rear surfaces of the airfoil-shaped blades, and a fluid (such as air or water) is accelerated by the pressure difference. Propeller dynamics, like those of aircraft wings, can be modelled by Bernoulli's principle and Newton's third law. Most marine propellers are screw propellers with helical blades rotating around an approximately horizontal axis or propeller shaft

# 5 Main Variable

1. Size
2. Pitch
3. Blade Configuration
4. Material
5. Design

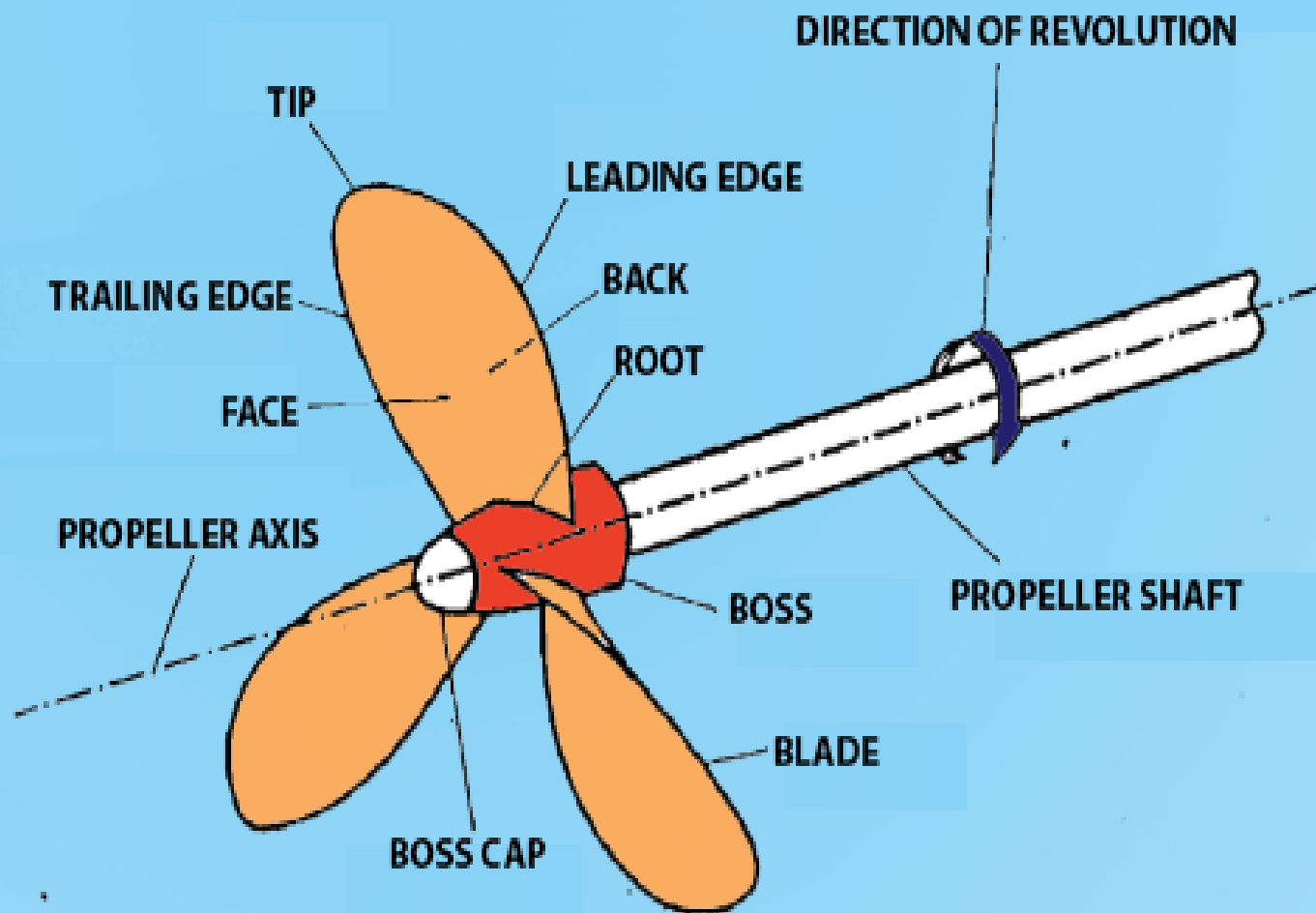




Pitch providing forward travel to a prop

# How many type of material are used propeller?

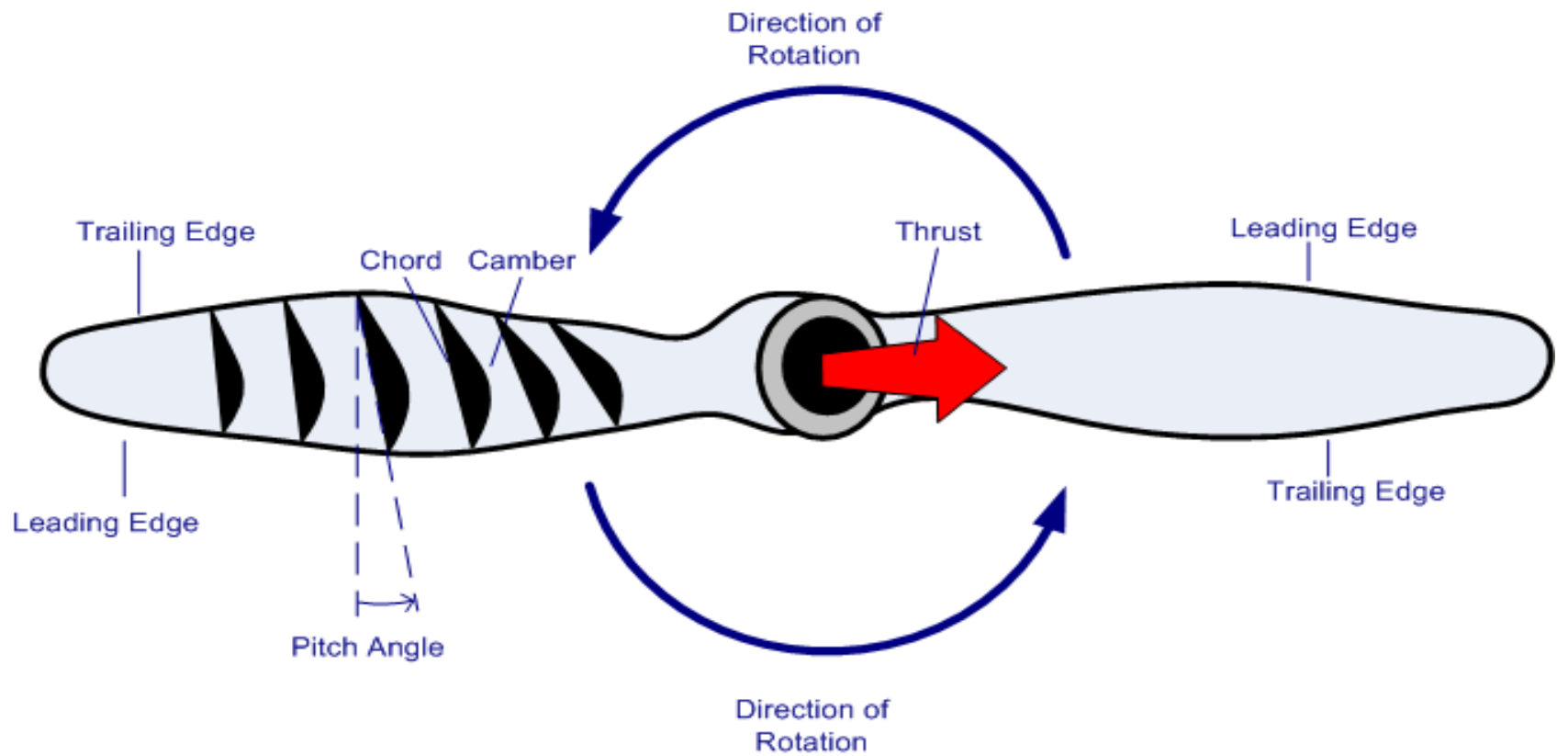
- Plastic
- Aluminium
- Wood
- Carbon Fibre
- Polycarbonate



# How it work ?

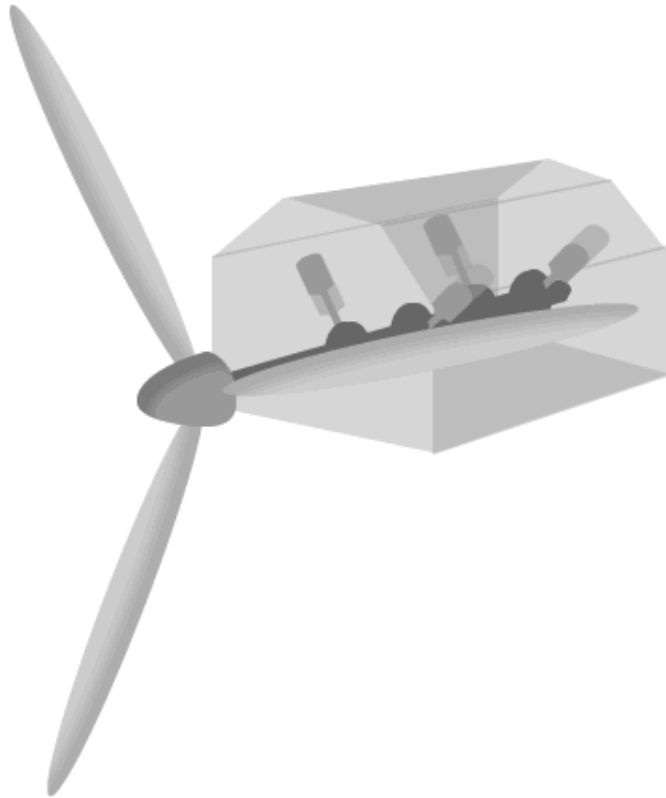
- A Propeller “Lifts” an Airplane Forward
- Think of a propeller as a spinning wing. Like a wing, it produces lift, but in a forward direction—a force we refer to as thrust. Its rotary motion through the air creates a difference in air pressure between the front and back surfaces of its blades.





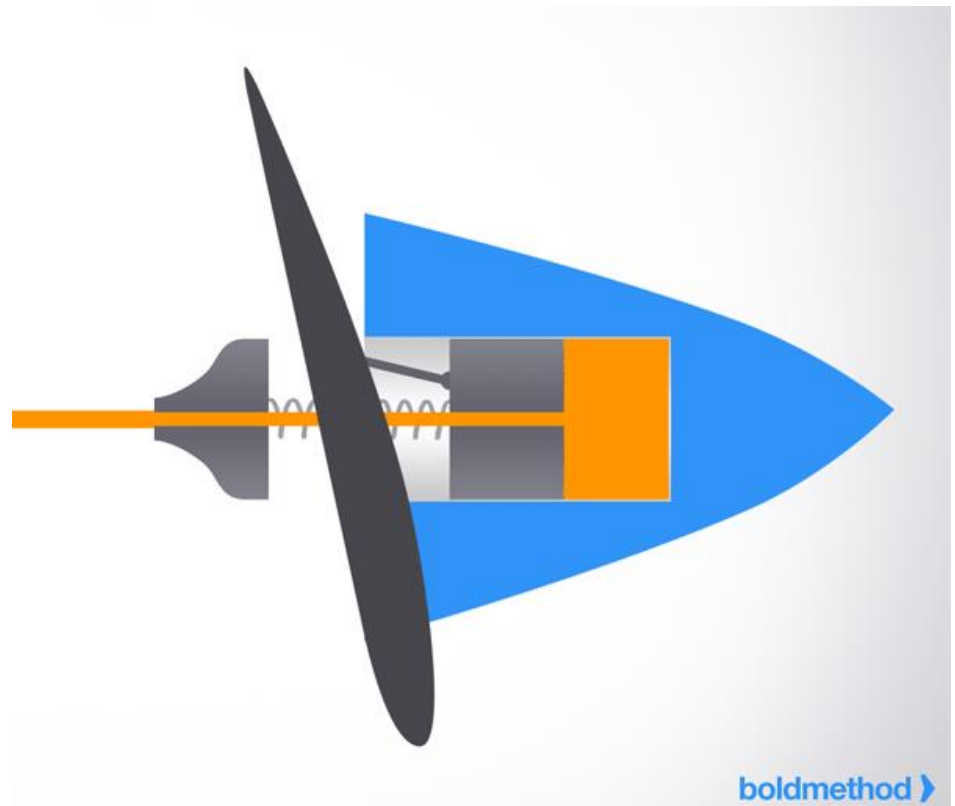
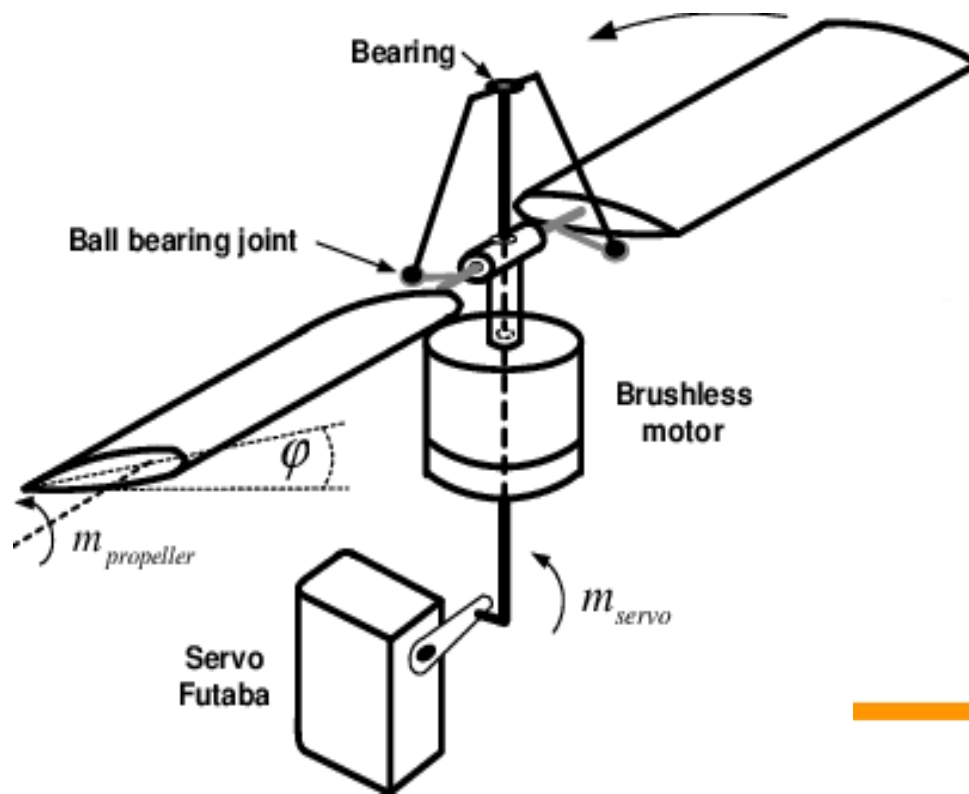
# Fixed Pitch

A **fixed pitch** propeller is the simplest of propeller designs and is associated with many light, piston engine aircraft. The angle of attack of a **fixed pitch** propeller is set at installation and cannot be changed during aircraft operation.



# Variable Pitch

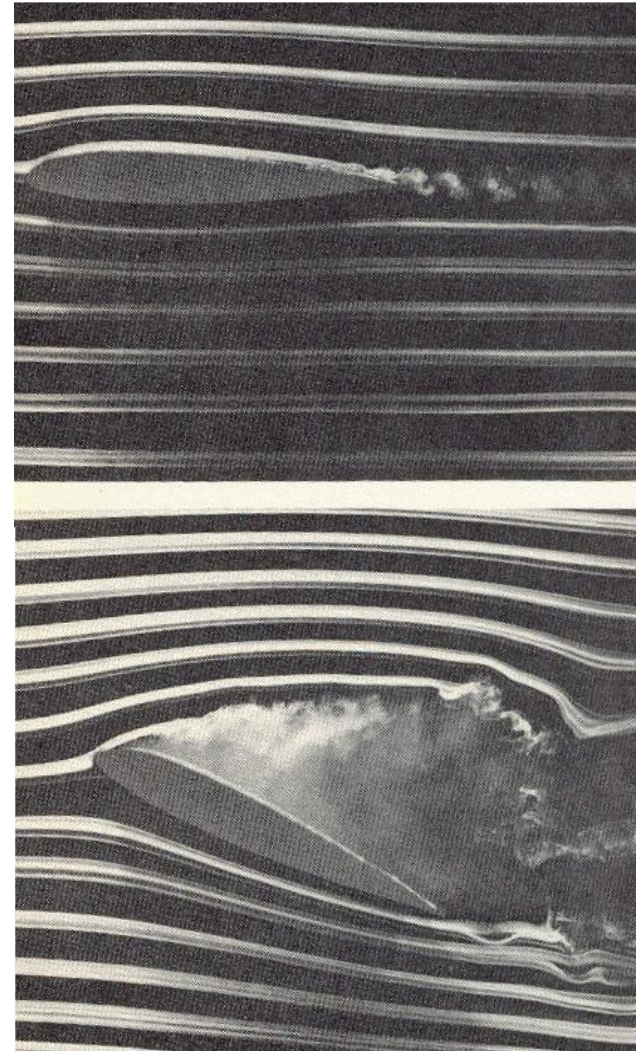
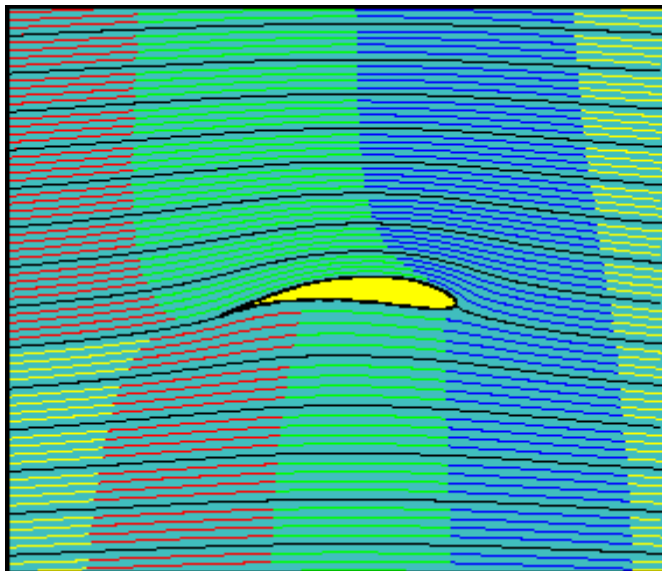
A variable pitch propeller is one in which the pilot is able to adjust the blade pitch during flight. The blade angle can thus be adjusted to its optimum value for the phase of flight, be it takeoff, climb or cruise. In some installations, it is possible to feather the propeller. For a variable pitch propeller, the pilot controls the blade pitch with the propeller control. However, the propeller RPM will vary, in the same fashion as a fixed pitch propeller, as a function of engine RPM or of airspeed. A more sophisticated variant of the variable pitch propeller is the constant speed propeller which, while in flight, will maintain the same RPM irrespective of throttle lever movement or airspeed.



# Airfoil

a structure with curved surfaces designed to give the most favourable ratio of lift to drag in flight, used as the basic form of the wings, fins, and horizontal stabilizer of most aircraft; an aerofoil.

# Flow over Airfoil





# Airfoil Shapes

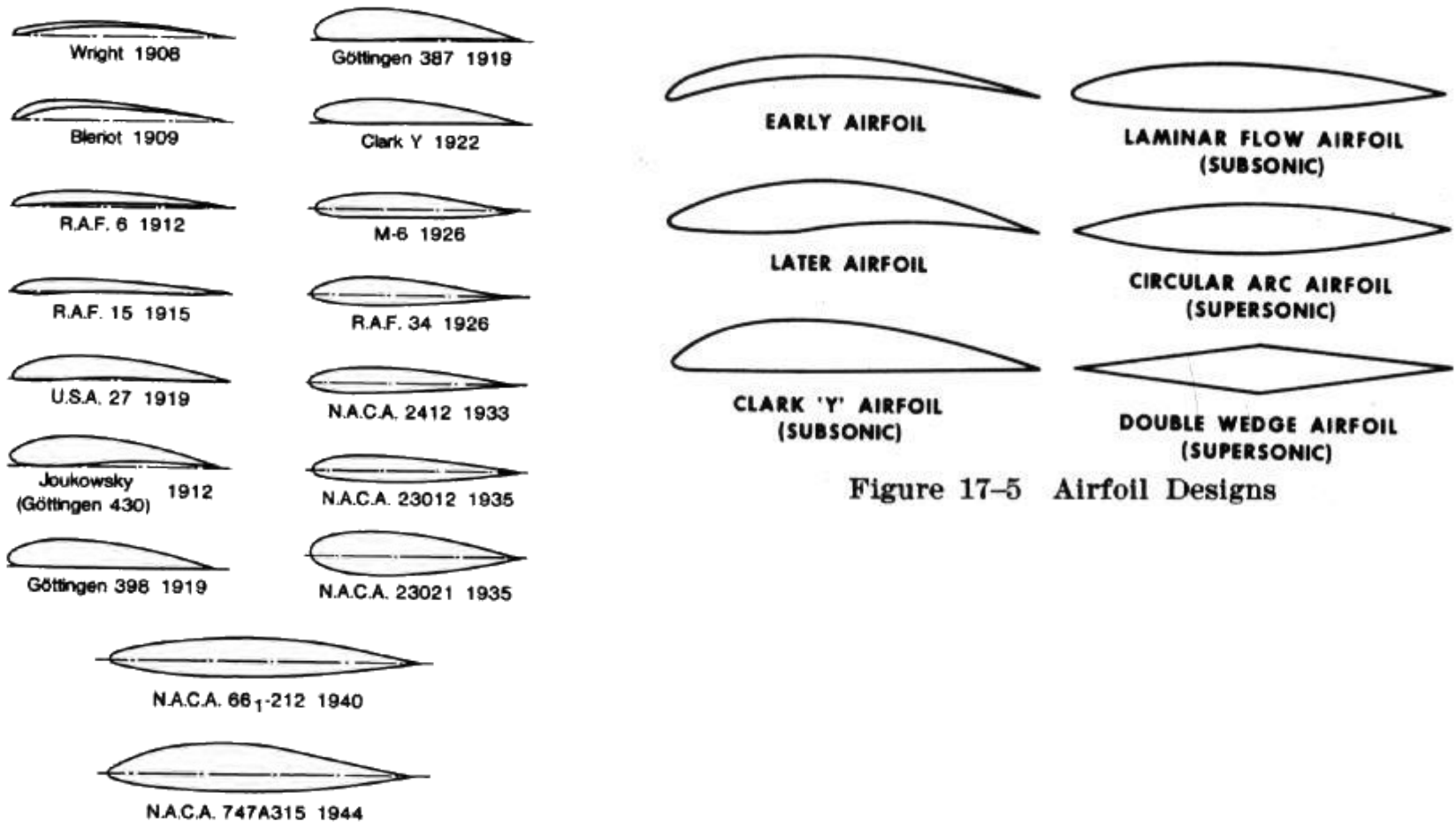


Figure 17-5 Airfoil Designs

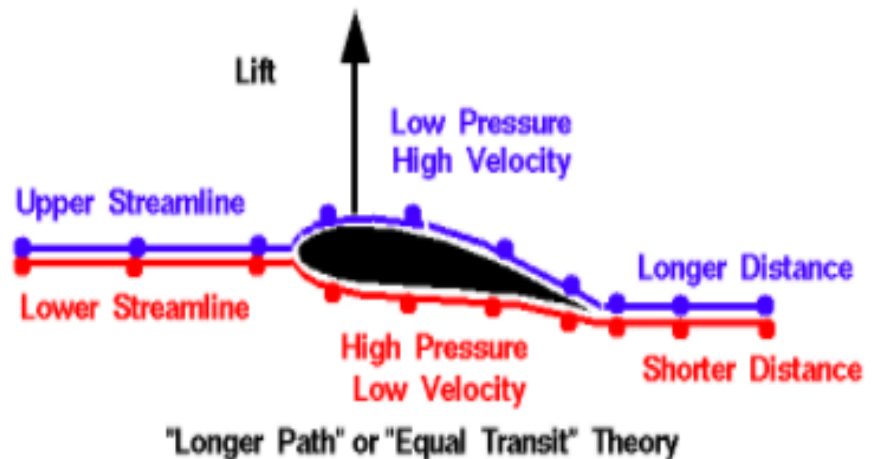


End.....



# Definition

Bernoulli's principle is formulated by Daniel Bernoulli that states that as the speed of a moving fluid (liquid or gas) increases, the pressure within the fluid decreases. ... Since the speed is greater in the narrower pipe, the kinetic energy of that volume is greater.



# How does the Bernoulli's principle work?

