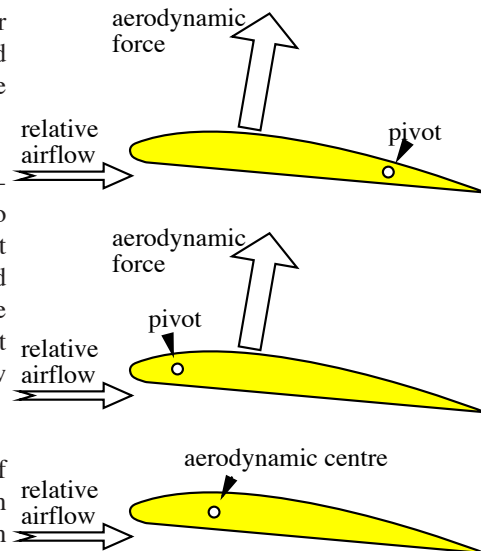**AERODYNAMIC CENTRE**

The centre of pressure of an aerofoil moves forward as angle of attack increases up to the stalling angle. This constant movement of the centre of pressure makes life a little difficult for design engineers when they set out to describe the behaviour of the aerofoil as angle of attack changes. This complication can be removed if we consider lift to act at a fixed point that does not move when angle of attack changes. Such a point can be located and it is called the **aerodynamic centre**.

The aerodynamic centre is of no interest to the pilot in any practical sense, it is purely a theoretical consideration that simplifies the mathematics for the designer. However, CASA may expect that you can at least define what is meant by the term - so here goes.

Consider an aerofoil in a wind tunnel at a positive angle of attack and imagine that it is pivoted at a point near the trailing edge. For any given angle of attack, the aerodynamic force acting would cause a moment that would tend to pitch the aerofoil leading edge up [clockwise].

Now move the pivot to a position near the leading edge. The aerodynamic forces would now generate a moment that would tend to pitch the aerofoil trailing edge up [anticlockwise]. Now, if the first position of the pivot generates a clockwise moment and the second position generates an anticlockwise moment, it follows that there must be a position in between where the moments balance. That point is called the aerodynamic centre and wind tunnel test show that it is located 25% of the chord from the leading edge.

Importantly, the aerodynamic centre also remains fixed as angle of attack changes. It is not the same as the centre of pressure which does move as angle of attack changes. It is the point about which the clockwise and anticlockwise momets remain constant with changing angle of attack.

To sum up.

The aerodynamic centre is the point about which the pitching moments remain constant.
It is situated at about 25% of the cord.
It doesn't change its position when angle of attack changes.
It is not the same as centre of pressure.