

Advanced Stalling

ADVANCED MANOEUVRES

Objectives

To experience the effect of power and/or flap on the aeroplane's speed and nose attitude at the stall.

To recognise the symptoms of the stall.

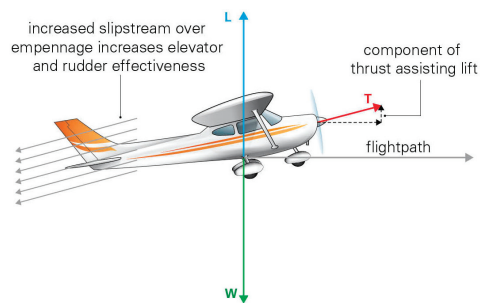
To stall the aeroplane and be able to recover from the stall by taking appropriate action.

1. Principles of Flight

- Aeroplane stalls at critical angle, and speed will vary with configuration
- Manufacturers list stall speeds for simplicity
- $L = \text{Angle of Attack} \times \text{Airspeed}$
- Anything that $\uparrow L$ required means an \uparrow airspeed at the stall
- \therefore airspeed will be higher at the critical angle
- Anything that $\downarrow L$ required means a \downarrow airspeed at the stall

Factors Affecting Stall Speed

Weight	$\uparrow W$ requires $\uparrow L \therefore \uparrow$ stalling speed	Same nose attitude
Ice/Damage	Changes flow and increases weight, requires $\uparrow L \therefore \uparrow$ stalling speed	Same nose attitude
Loading	\uparrow Apparent weight requires $\uparrow L \therefore \uparrow$ stalling speed	Same nose attitude
Power	\uparrow Power requires $\downarrow L$ due \uparrow airspeed over wing $\therefore \downarrow$ stalling speed	Higher nose attitude
Slats/Slots/Flap	Flap $\uparrow L$ and \downarrow stalling speed	Lower nose attitude
Aileron	Down-going wing will have \uparrow AoA, beyond stall $\downarrow L$ and $\uparrow D$ further \rightarrow continued roll, not stopping it	



2. Airmanship

- No pax
- Awareness of aircraft configuration, symptoms, traffic
- HASELL checks
- HELL checks

3. Aeroplane Management

- Smooth but positive throttle and control movements
- Carb heat
- Ts & Ps

5. Air Exercise

Entry

- HASELL checks and reference point (high)
- Carb heat HOT
- Close throttle/reduce power as applicable
- Keep straight with rudder
- Maintain altitude with \uparrow backpressure
- Through _____ kts (white arc) select flap, adjust attitude
- Through _____ kts (stall warning sounds), carb heat COLD

Symptoms

- Observe effects of power, flap, and power and flap
- Low and \downarrow airspeed
- High nose attitude

At the Stall

- Aeroplane sinks and nose pitches down

Recovery

To Unstall

- Check forward with control column to reduce angle of attack

To Minimise Height Loss – max of 100'

- Power + Attitude = Performance**
- Unstall, as above, check forward
- Apply full power – balance with rudder
- Raise nose to the horizon (stops sink and allows acceleration)
- Reduce from full flap, 1 setting

Recovery at Onset

- Normal situation – when not training
- Recover at stall warning / buffet
- Height loss – 50' maximum

4. Human Factors

- More practice and exposure the better
- Plenty of time between stalls to orientate
- Unusual attitude possible, but plenty of height for recovery



- Less effective controls
- Stall warning – if fitted
- Buffet

- Do not use ailerons

- At safe altitude, safe airspeed, and +ve RoC, raise all flap, adjust attitude
- Regain starting altitude and S+L