

Advanced stalling

ADVANCED MANOEUVRES

Objectives

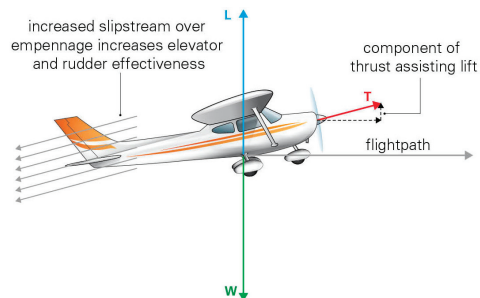
- To experience the effect of power and flap on the aeroplane's speed and nose attitude at the stall.
- To recognise the symptoms of the stall.
- To stall the aeroplane and be able to recover from the stall by taking appropriate action.

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	



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 _____ kt (white arc) select flap, adjust attitude
- Through _____ kt (stall warning sounds), carb heat COLD



Symptoms

- Observe effects of power, flap, and power and flap
- Low and \downarrow airspeed
- High nose attitude
- Less effective controls
- Stall warning – if fitted
- Buffet

At the stall

- Aeroplane sinks and nose pitches down

Recovery

To unstall

- Check forward with control column to reduce angle of attack
- Do not use ailerons

To minimise height loss – max of 100 ft

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

Recovery at onset

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

Airmanship

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

Aeroplane management

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

Human factors

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