Advanced stalling

Objectives

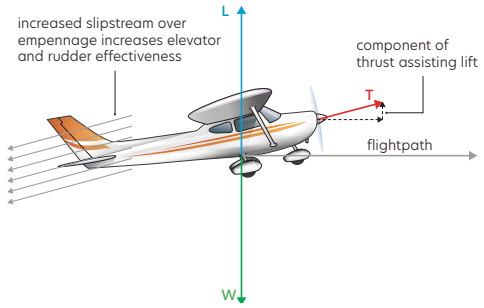
- To experience the effect of power and flap on the aeroplane's speed and nose attitude at the stall.
- To recognise the symptoms of the stall.
- To stall the aeroplane and be able to recover from the stall by taking appropriate action.

Principles of flight

- Aeroplane stalls at critical angle, and speed will vary with configuration
- Manufacturers list stall speeds for simplicity
- L = Angle of attack x airspeed
- Anything that ↑ L required means an ↑ airspeed at the stall
- Therefore airspeed will be higher at the critical angle
- Anything that ↓ L required means a ↓ airspeed at the stall

Factors affecting stall speed

Weight	↑ W requires ↑ L therefore ↑ stalling speed	Same nose attitude
Ice/damage	Changes flow and increases weight, requires ↑ L therefore ↑ stalling speed	Same nose attitude
Loading	↑ Apparent weight requires ↑ L therefore ↑ stalling speed	Same nose attitude
Power	↑ Power requires ↓ L due ↑ airspeed over wing therefore ↓ stalling speed	Higher nose attitude
Slats/slots/flap	Flap ↑ L and ↓ stalling speed	Lower nose attitude
Aileron	Down-going wing will have ↑ AoA, beyond stall ↓ L and ↑ D further → 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 ↑ 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 ↓ 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