



VICTORIA FLYING CLUB

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Stalls

- Review Slow Flight
- Definition and Motivation
- **Power-Off and Power-On Stalls**
- **Accelerated, Approach and Departure Stalls**
- Summary and Questions
- Pre-Flight Briefing

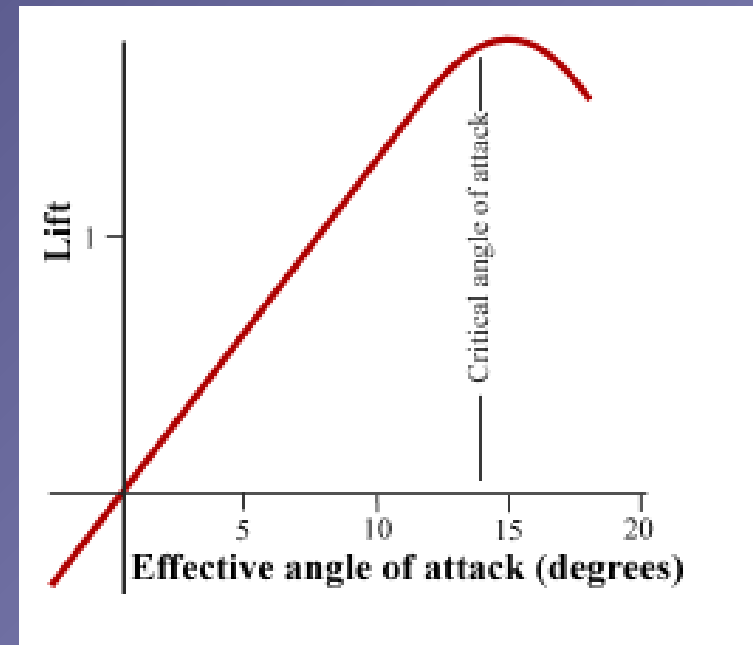
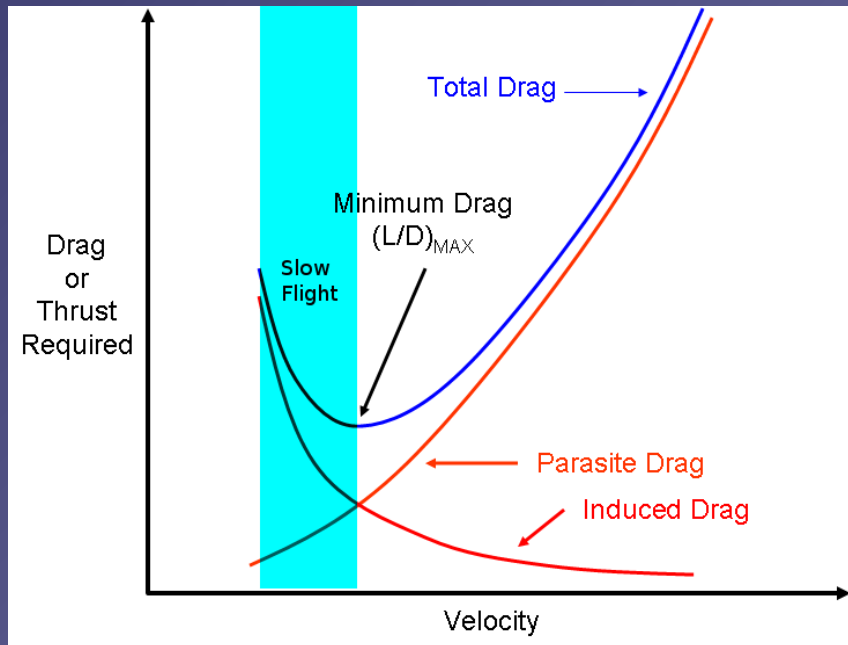


Review Slow Flight

- *Attitude plus power equals performance!*
- Mentally enter a slow flight in landing configuration from cruise flight and state all observations and required actions.
- What particular observation applies to the control inputs compared to normal cruise flight?
- Mentally recover from a slow flight in landing configuration and state all observations and required actions.



Definition and Motivation



- *Lower limit* of the slow flight range
- Any angle of attack *beyond* the **critical angle of attack** at which any further increase leads to *less lift* and *more drag*
- *Imminent* – **stall warning, bottom of arc, buffet**
- *Fully Developed* – nose or wing drop



Safety Considerations

- *High* **nose-up attitude** maneuver
- *Limited* forward visibility
- **HASEL**, recovery at or above **2000 ft AGL**
- Maintain good **lookout** during maneuver
- **Yaw** is to be controlled *precisely* with **rudder**
- Remain **coordinated** at all times (depending on stall type)
- Consider **utility category** for **wing drop** stalls



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Entering a Power-Off Stall

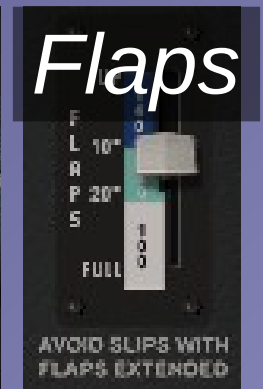


- Perform **HASEL** checks and continue **lookout** during the maneuver
- Reduce **power** to *idle*, **decelerate** and control yaw
- Apply **elevator** back-pressure *as required* to increase **nose-up attitude** controlling yaw with **rudder** while maintaining **altitude**
- Extend **flaps** *in stages* to desired degree in **white arc**



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Recovering a Power-Off Stall



- Release **elevator** back-pressure to lower the nose *immediately*
- Apply *full* **power** controlling **yaw** with **rudder** to remain **coordinated**
- **Accelerate** past the slow flight range and recover **altitude** (**V_x**)
- Retract **flaps** *in stages* to up in **white arc**
- Establish **cruise attitude** and **accelerate** to **cruise airspeed**
- Reduce power to **cruise power** setting and finally **trim**



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Entering a Power-On Stall

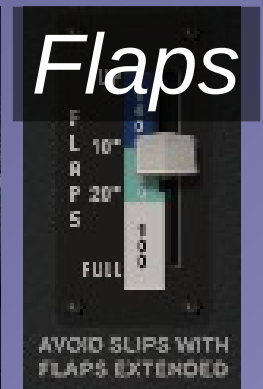


- Perform **HASEL** checks and continue **lookout** during the maneuver
- Apply **elevator** back-pressure to increase and *hold* **nose-up attitude** controlling **yaw** with **rudder**
- Extend **flaps** *in stages* to desired degree in **white arc**



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Recovering a Power-On Stall



- Release **elevator** back-pressure to lower the nose *immediately*
- Apply *full* **power** controlling **yaw** with **rudder** to remain **coordinated**
- **Accelerate** past the slow flight range and maintain **altitude**
- Retract **flaps** *in stages* to up in **white arc**
- Establish **cruise attitude** and **accelerate** to **cruise airspeed**
- Reduce power to **cruise power** setting and finally **trim**



Power-On versus Power-Off Stall

- *Slightly lower **stall speed** and **higher pitch attitude***
- *More **directional control** and **coordination** required*
- ***Ailerons** are even *less* effective*
- *More **rudder** and **elevator** effectiveness (slipstream)*
- *More **pronounced change** in **pitch attitude***

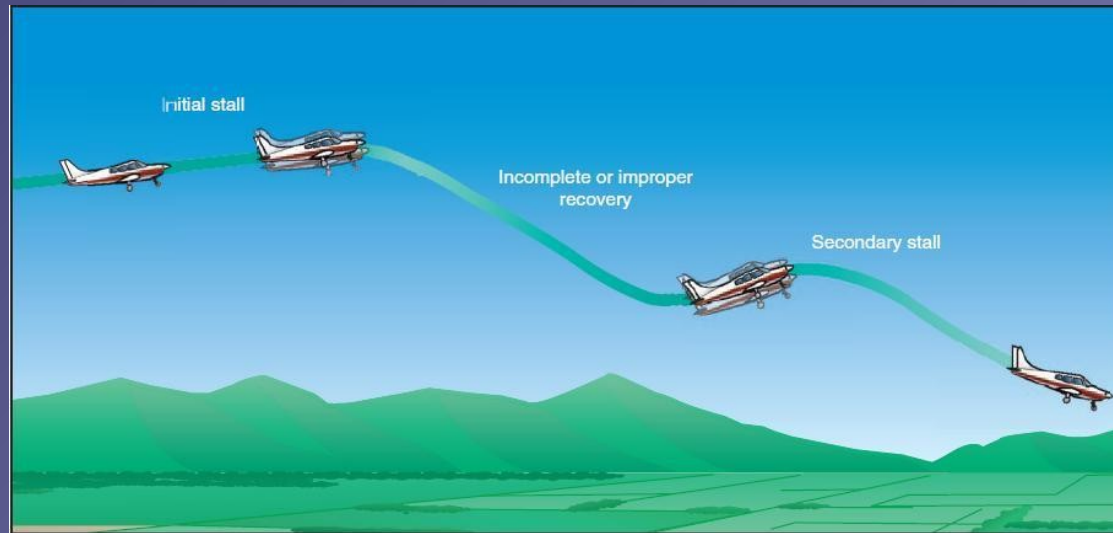


Imminent and Fully Developed Stalls

- Stall **recovery** in normal flight operations should be performed *as early as possible* – during the **imminent stall**
- Recover at the *first indication* of **stall warning, bottom of arc** or **buffet**
- Fully developed stalls are practiced to develop **proficiency** in **recognition** and **recovery only**



Accelerated Stall



- *High load factors* and *abrupt elevator* back-pressure may lead to a stall at *any* **airspeed** and **attitude**
- *Only* the **critical angle of attack** needs to be exceeded
- An incorrect stall recovery may lead to a **secondary stall**
- *High airspeed* and *significant buffet* may result



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Approach / Turning Stall

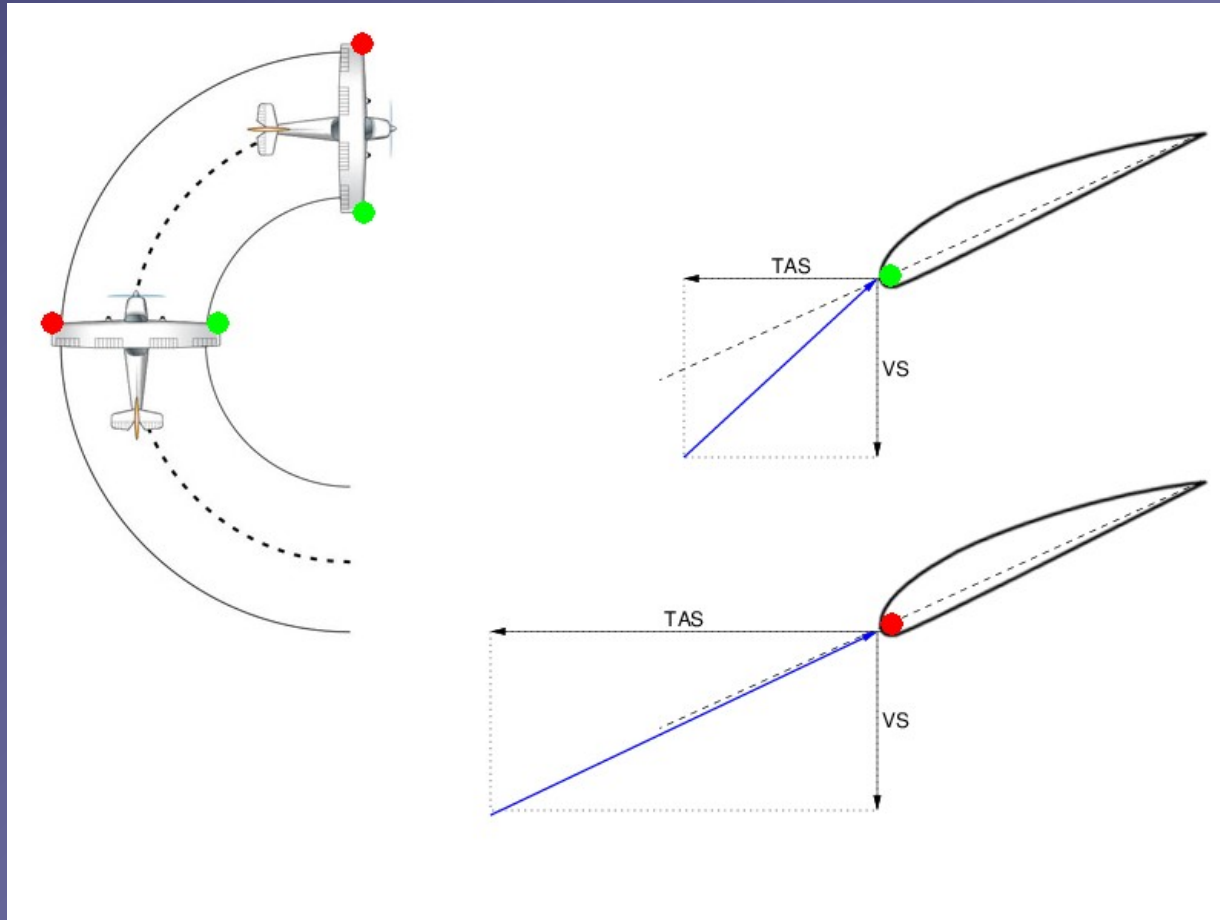


- Establish a power-off descending turn
- Increase bank attitude with *high rate of turn* (potential skid)
- Inner **wing** *may stall first* and drop
- Release **elevator** back-pressure lowering nose, apply *opposite rudder*, then *neutralize*, **wings level** and ease out of dive applying **power**



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Approach / Turning Stall AoA





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Departure / Turning Stall

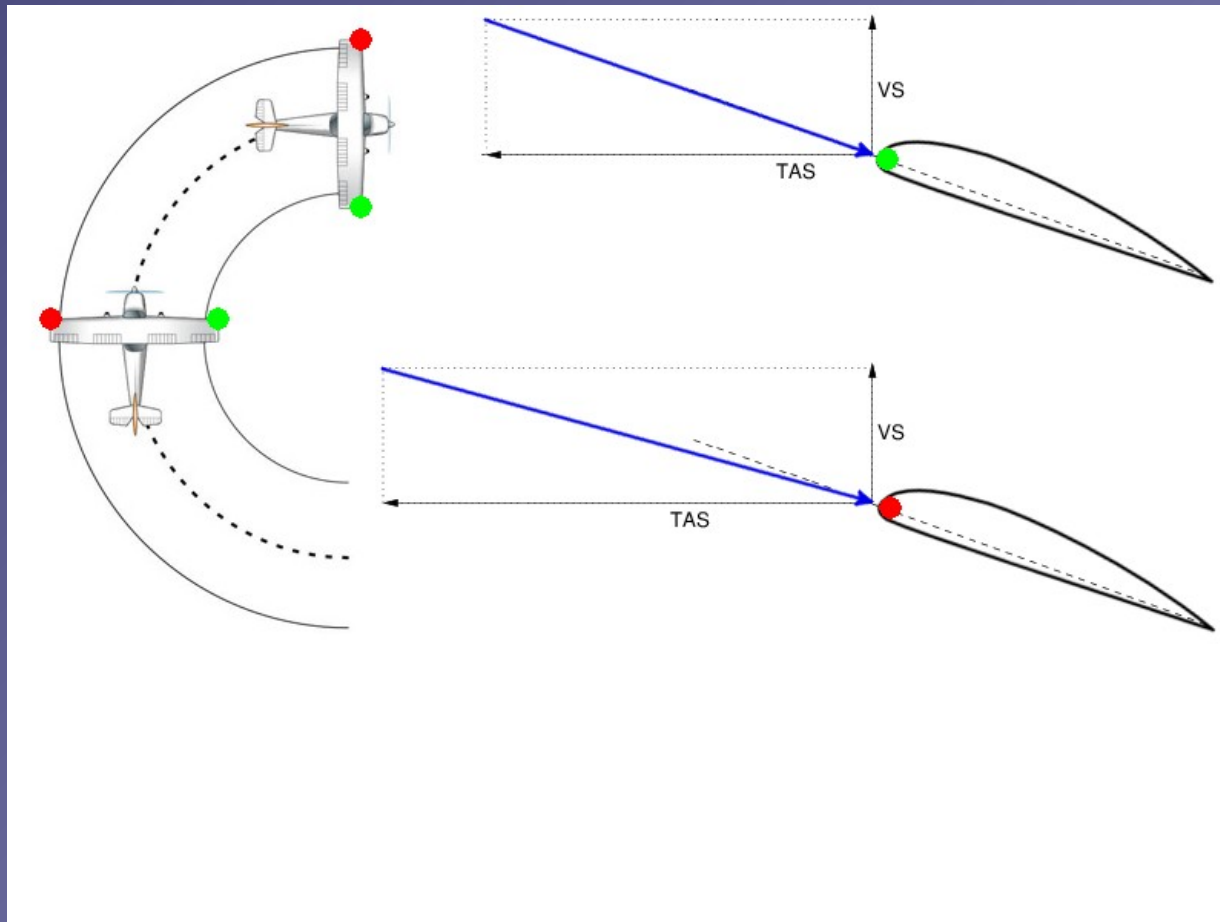


- Establish a power-on climbing turn
- Increase nose-up attitude *while* turning
- *Outer wing may stall first and drop – opposite to the turn*
- Release **elevator** back-pressure lowering the nose, apply *opposite rudder*, then *neutralize*, **wings level** and ease out of dive applying **power**



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Departure / Turning Stall AoA





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Summary / Quiz

- Define a stall and describe the indications of a stall.
- What airspeed or attitude is required to produce a stall?
- Mentally enter and recover a clean power-off stall from cruise flight and state all observations and required actions.
- Mentally enter and recover a power-on stall with flaps from cruise flight and state all observations and required actions.
- Mentally enter and recover a departure stall and state all observations and required actions.



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Pre-Flight Briefing

- Exercise
- Training Area
- Departure and Arrival Procedures
- Weather Briefing / NOTAMs
- Aircraft and Documents
- Time and Fuel Requirements
- Safety Considerations and Responsibilities



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Additional Materials

- Additional materials for Stalls
- Flight Instructor Guide – Exercise 12, Lesson Plans 5, 6



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Entering a Reduced Power-On Stall



- Perform **HASEL** checks and continue **lookout** during maneuver
- Reduce **power** to low power setting (**1500 RPM**)
- Apply **elevator** back-pressure *as required* to increase **nose-up attitude** controlling **yaw** with **rudder** while maintaining **altitude**
- Extend **flaps** *in stages* to desired degree in **white arc**