

4 Day Multi Engine Course

Your 4 day course begins with one full day of ground instruction and simulator training to help you be ready to perform your maneuvers when you begin the flight portion of your training program.

This is an instrument intensive course, so your instrument proficiency level will greatly affect your level of success in the course. We recommend arriving a day early for an instrument refresher if you are not instrument proficient/current. Please familiarize yourself with the ILS 10R and the VOR DME 10R instrument approaches into the Boise Airport.

Seneca Maneuvers and Course Syllabus

V_{mc}

Depending on density altitude, V_{mc} may occur at an airspeed that is lower than stall speed. When increasing the pitch of the aircraft for this demonstration, pitch for a one knot per second decrease in airspeed. As the speed decreases, additional aileron will be needed to a maximum of 5 degrees of bank. Recovery should be made at the first indication of stall horn, stall buffet, or loss of directional control.

Note that the gear horn will sound with a reduction in MP on the failed engine. Do not confuse this warning with the stall warning.

1. Clearing turns
2. Clean configuration: mixtures rich, props full forward.
3. Close left throttle, maintain altitude and heading.
4. Slow to 92Kts. (blue line)
5. Increase power on operating engine to full power, add up to 5 degrees bank towards operating engine.
6. Slowly increase pitch as the airspeed decreases at about one knot per second, until full rudder is applied.
7. Recover at the first sign of loss of directional control, stall horn, or stall buffet. (Or upon reaching redline on your checkride.)
8. To recover, immediately reduce power on operating engine and reduce pitch attitude as necessary to regain control. Maintain heading within 20 degrees.
9. Slowly increase power on operating engine and maintain a pitch attitude that will allow for an increase in airspeed to maintain altitude and directional control.
10. Accelerate to 92 Kts. (blue line)
11. Bring throttles together to 20" MP. Allow failed engine to warm up slowly.
12. Complete cruise checklist.

Be aware that on your checkride, the examiner will have you recover from a simulated loss of control upon reaching V_{mc} (66Kts), due to the hazards of reaching a stall condition before reaching the actual V_{mc} airspeed. During your training, we will restrict the use of the rudder in order to force loss of control at a higher airspeed.

Steep Turns

Steep turns are to be accomplished above 3000' AGL. Maintain altitude and coordination during the maneuver. Roll into turns at a smooth and steady rate.

1. Clearing turns

2. Set power to 22" MP, and 2400 RPM.
3. Set heading bug to entry heading, use outside reference if possible.
4. Maintain altitude within 100'.
5. Maintain 105-110 Kts or a safe airspeed at or below V_A .
6. Increase throttle to 25" MP to *maintain airspeed and altitude*.
7. Perform 360 degree turn to the left, maintain bank angle of 45 degrees, within 5 degrees. (50 for commercial rating.)
8. Roll out on entry heading within 10 degrees. Commercial students will immediately roll into and complete a steep turn to the right, or pause and begin steep turn to the right.
9. Complete cruise checklist.

Slow Flight

Slow flight must be performed at or above 3000' agl.

1. Clearing turns
2. Cowl flaps open
3. Throttles set to 20" MP
4. Complete gear down before landing checklist
5. Flaps 40 degrees
6. Trim to maintain 70 Kts and hold altitude, throttle set to 21-23" MP or whatever is required to hold altitude.
7. Maintain altitude +/- 100' for private standards, +/-50' for commercial standards.
8. Complete cruise checklist.

Power-Off Stalls (Landing Configuration)

Stalls are to be completed above 3000' AGL. May be performed with a 15 degree banked turn.

1. Clearing turns
2. Complete gear-down before landing checklist
3. Extend flaps to 40 degrees.
4. Maintain heading and altitude.
5. Establish 15 degree bank if specified
6. Reduce power to idle.
7. Establish descent at 92 Kts
8. Once descent is stabilized, pitch up to 10 degrees to cause stall.
9. Identify each sign of a stall: stall horn, buffet, or loss of control.
10. Recover with a minimum loss of altitude.
11. Reduce angle of attack, level wings, set throttles to 40" MP.
12. Slowly retract flaps with positive rate of climb
13. Accelerate to V_y .
14. Retract gear
15. Complete cruise checklist.

Power-On Stalls (Clean Configuration)

Stalls are to be completed above 3000' AGL. May be performed with a 15 degree banked turn.

1. Clearing turns
2. Configure aircraft for take off configuration (gear and flaps up)

- Mixtures rich
 - Props 2600 rpm.
3. Reduce power to 15" – 20", slow to 92Kts. (blue line)
 4. Maintain heading, establish 15 degree bank if specified.
 5. Smoothly pitch up to 15 degrees while increasing power to 27" MP.
 6. Identify each sign of a stall: stall horn, buffet, or loss of control, with a minimum loss of altitude.
 7. Recover by reducing angle of attack, level wings, simulate full power.
 8. Accelerate to 92 Kts, establish a positive rate-of-climb.
 9. Cruise checklist.

Emergency Descent

1. Complete clearing turns including airspace below aircraft.
2. Configure aircraft:
 - Propellers – FULL FORWARD,
 - Throttle – IDLE,
 - Flaps – UP,
 - Gear – DOWN <130 Kts
3. Pitch for maximum gear extended airspeed (130 Kts– V_{LE}), while in a turning descent of no more than 30° – 40° of bank.
4. Complete appropriate emergency checklist.

Important Checklists

Checklists can be performed from memory (using a flow) or from a list, but it must always be backed up with a written checklist.

Gear Down Before Landing

1. Gear lever down, check for 3 green lights, no red lights, nose wheel visible in mirror.
2. Fuel selectors on
3. 10 degrees flaps
4. Mixtures forward as necessary
5. Props forward as necessary

Engine Failure

1. Maintain altitude and blue line
2. Mixtures set
3. Props set
4. Throttles set
5. Gear up unless needed for landing
6. Flaps up
7. Identify: Dead foot, dead engine.
8. Verify by moving suspect throttle to idle
9. If no change in power:
 1. Fix or feather: if below 1500' AGL, feather failed engine's prop
 2. If above 1500' AGL, consider trying engine restart with checklist
10. Mixture idle cut-off

At this point, refer to the emergency checklist in the aircraft for further checklist items.

Ground school Syllabus

Review power point presentation: (2.5 hours)

1. Multi-engine aerodynamics
 - Engine failure aerodynamics
 - Side-slip vs. zero side-slip
 - Critical engine determination
2. Performance charts:
 - Take-off and landing distances
 - Single-engine vs. multi-engine climb performance
 - Accelerate stop distance
3. Aircraft Systems
4. Flight procedures
 - Maneuvers
 - PTS
 - Checklists

Simulator tasks: (4.5 hours)

1. Overview of tasks and goals
2. Aircraft/simulator familiarization
3. Normal Maneuvers
 - Normal take off
 - Steep turns
 - Flight at MCA and various airspeeds
 - Power off stalls
 - Power on stalls
4. Instrument tasks
 - VOR approaches
 - GPS approaches
 - ILS approaches
5. Engine failures
 - Engine failure detection
 - Fix or feather decision parameters
 - Engine failure checklist
 - Securing failed engine
 - Single engine flight control
 - Maintaining airspeed and altitude
 - Monitoring and preserving operating engine
 - Engine failures during all phases of take-off
6. Engine failure during instrument approaches
 - Fix or feather considerations
 - VOR/DME via Arc
 - ILS
7. Vmc demonstration