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/Garmin 430 if you are not instrument proficient/current, or have never used a Garmin 430 or other IFR certified GPS for instrument approaches. If you choose not to use this option, please be sure to study the manual and simulator for the Garmin 430 (found on Garmin's website), and familiarize yourself with the instrument approaches into the Boise and Caldwell airports.

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 pitching the aircraft up 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. 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, fuel pumps on.
3. Close left throttle, maintain altitude and heading.
4. Slow to 105 mph. (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.
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 105 mph. (blue line)
11. Bring throttles together to 17" MP. Allow failed engine to warm up slowly.
12. Complete cruise checklist.

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 17" MP, and 2300 RPM.
3. Set heading bug to entry heading, use outside reference if possible.
4. Maintain altitude within 100'.

5. Maintain 120 - 125 mph or a safe airspeed at or below V_A.
6. Increase throttle to 19" MP to *maintain airspeed and altitude*.
7. Perform 360 degree turn to the left, maintain bank angle of 45 degrees, within 5 degrees.
8. Roll out on entry heading within 10 degrees. Commercial students may 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 closed
3. Throttles set to 14" MP
4. Complete gear down before landing checklist
5. Flaps 40 degrees
6. Trim to maintain red line and hold altitude, throttle set to 17" MP or whatever is required to hold altitude.
7. Complete cruise checklist

Power-On Stalls (Clean Configuration)

Stalls are to be completed about 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 2500 rpm.
   - Fuel pumps on
3. Slow to 105 mph. (blue line)
4. Maintain heading, establish 15 degree bank if specified.
5. Smoothly pitch up to 15 degrees while increasing power to 19" MP.
6. Recover at the first sign of a stall: stall horn, buffet, or loss of control, with a minimum loss of altitude.
7. Reduce angle of attack, level wings, simulate full power.
8. Accelerate to 105 mph, establish a positive rate-of-climb.
9. Cruise checklist.

Power-Off Stalls (Landing Configuration)

Stalls are to be completed about 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 12" MP
7. Establish descent at 95 mph

8. Once descent is stabilized, pitch up to 10 degrees to cause stall.
9. Recover at the first sign of a stall: stall horn, buffet, or loss of control, with a minimum loss of altitude.
10. Reduce angle of attack, level wings, increase throttle to full forward.
11. Slowly retract flaps with positive rate of climb
12. Accelerate to Vy.
13. Retract gear
14. Complete cruise 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
6. Fuel pumps on

Engine Failure

1. Maintain altitude and blue line
2. Mixtures forward
3. Props forward
4. Throttles forward
5. Gear up unless needed for landing
6. Flaps up
7. Fuel pumps on
8. Identify: Dead foot, dead engine.
9. Verify by moving suspect throttle to idle
10. 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
11. 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
   - RNAV
   - VOR/DME via Arc
   - ILS
7. Vmc demonstration