Cessna 172N Skyhawk Standardization Manual

This manual is to be utilized in conjunction with the manufacturers approved POH/ AFM and the Airplane Flying Handbook (FAA-H-8083-3A). This manual should be used as a reference for approximate power settings and Leading Edge Aviation standard procedures. Adjustments in suggested power settings may be required to attain desired speeds. This manual should be used for training purposes only and final authority will be with the Pilot in Command.

Normal Takeoff and Climb

Objective: To develop the students ability to safely take the aircraft off the ground and depart to take off area during normal conditions.

Procedure:

1. Visually note wind direction and speed.
2. Taxi onto the runway, aligning the nose wheel with the centerline.
3. Apply full throttle.
4. Maintain directional control with rudder pedals.
5. Announce “Engine instruments in the green, airspeed is alive, _____ RPM.”
6. Rotate at 55 KIAS.
7. Pitch for 70 KIAS with reference to the natural horizon.
8. Maintain an initial climb speed of 70 KIAS.
9. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
10. At 1000’ AGL, complete the climb checklist.

Crosswind Takeoff and Climb

Objective: To develop the students ability to safely take the aircraft off the ground and depart the takeoff area during crosswind conditions.

Procedure:

1. Visually note wind direction and speed.
2. Taxi onto the runway, aligning the aircraft with the centerline.
3. Apply FULL ailerons into the wind with the elevator placed in the neutral position.
4. Apply full throttle.
5. Maintain directional control with the rudder pedals.
6. Announce “Engine instruments in the green, airspeed is alive, _____ RPM.”
7. Adjust the ailerons to keep wings level during the ground role.
8. Rotate firmly at 55 KIAS.*
9. Establish a wind correction angle in order to maintain a ground track which is aligned with the runway centerline.
10. Pitch for 70 KIAS with reference to the natural horizon.
11. Maintain an initial climb speed of 70 KIAS.
12. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
13. At 1000’ AGL, complete the climb checklist.

Short Field Takeoff and Climb

Objective: To teach the student to obtain maximum performance during the takeoff phase so as to minimize runway length required for takeoff.

Procedure:

1. Visually note wind direction and speed.
2. Flaps should not be used in this model of aircraft.
3. Taxi onto the runway, aligning the nose wheel with the centerline.
4. Hold the brakes firmly to prevent the aircraft from rolling.
5. Smoothly apply full throttle.
6. Announce “Engine instruments in the green, _____ RPM.”
7. Smoothly release the brakes and announce “Airspeed is alive.”
8. Maintain directional control with rudder pedals.
9. Lift off at 52 KIAS*.
10. Pitch up to maintain 59 KIAS* until obstacles are cleared.
11. After obstacle clearance is assured, pitch for an attitude which will allow the aircraft to accelerate to either V_x or V_y as appropriate.
12. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
13. At 1000’ AGL, complete the climb checklist.

**Note: Lift off speed and climb speed are dependent on weight. Consult the performance section of the POH.*

Soft Field Takeoff and Climb

Objective: To obtain maximum performance when taking off from other than a smooth, hard surfaced runway.

Procedure:

1. Visually note wind direction and speed.
2. Set flaps to 10°.*
3. Taxi onto the runway while holding full aft elevator.
4. Minimize brake usage while aligning the nose wheel with the centerline.
5. Smoothly apply full throttle without stopping.
6. Maintain directional control with rudder pedals.
7. Announce “Engine instruments in the green, airspeed is alive, _____ RPM.”
8. As the nose wheel comes off the ground, adjust pitch attitude as necessary to keep the nose gear just clear of the runway surface.
9. As the main wheels lift off, lower the pitch to a level flight attitude to stay in ground effect.
10. Accelerate to 60 KIAS and set the pitch to approximate V_y climb attitude and accelerate to V_y.
11. Retract flaps after obstacle clearance is assured and pitch for an attitude which will allow the aircraft to accelerate to either V_x or V_y as appropriate.
12. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
13. At 1000’ AGL, complete the climb checklist.

**Note: The use of flaps is not recommended for takeoff over an obstacle in high density altitude conditions.*

Traffic Pattern Operations

Objective: To develop the ability to conduct safe and efficient arrival and departure procedures that uncontrolled airports.

Procedure:

1. Complete the Descent Checklist.
2. Determine the active runway and estimate the crosswind component.
3. Pattern altitude must be established at least 2 miles prior to entering the downwind.
4. Slow the aircraft to 90 KIAS (approximately 2300 RPM).
5. Establish a 45° entry to the midpoint of the downwind leg.
6. Adjust speed and course as appropriate to maintain proper spacing from aircraft already established in the traffic pattern.
7. Turn downwind at approximately 1/2 to 1 mile from the active runway.
8. Prior to midfield, perform the Before Landing checklist.
9. When abeam the point of intended landing, reduce the throttle to 1700 RPM, turn carburetor heat ON, set flaps to 10°, and adjust the pitch attitude to maintain a 80 KIAS descent.
10. When the touchdown point is positioned 45° behind the wing of the aircraft, turn onto the base leg and lower the flaps to 20° while maintaining a 70 KIAS descent.
11. Turn onto the final leg with the airplane aligned on the runway centerline and lower the flaps as appropriate.
12. Refer to the appropriate landing procedure.

Clearing Procedure

Objective: To teach the students to exercise conscientious and continuous surveillance of the airspace in which the airplane is being operated and configure the aircraft for maneuvering flight.

Procedure:

First 90° clearing turn:

1. Visually scan the area to the left and right of the aircraft.
2. Pick a visual landmark off the wing tip in the direction of turn to roll out on.
3. Raise the wing in the desired direction of the turn, announce clear left/right (as appropriate), and enter a 30° bank in that direction.
4. Continuously scan the area ABOVE, BELOW, and AHEAD of the flight path.
5. After 90° of turn is completed, roll out wings level on your selected landmark.

Second 90° clearing turn:

6. Visually scan the area to the left and right of the aircraft.
7. Pick a visual landmark off the wing tip in the direction of turn to roll out on.
8. Raise the wing in the opposite direction of the turn, announce clear left/right (as appropriate), and enter a 30° bank in that direction as the first 90° of heading change.
9. Continuously scan the area ABOVE, BELOW, and AHEAD of the flightpath.
10. After 90° of turn is completed, roll out wings level on your selected landmark.

Maneuvering During Slow Flight

Objective: To teach the student to recognize changes in aircraft flight characteristics and control effectiveness at critically slow airspeeds in various configurations.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 2000' AGL.
2. Complete CRAGS.
3. Reduce power to 1500 RPM and turn carburetor heat ON.
4. Pick a visual reference point to assist in maintaining heading.
5. Below 110 KIAS, extend flaps to 10°; below 85 KIAS, extend to full.
6. When the airspeed is approximately 10 KIAS above the target airspeed, add power.

Configuration	Target Speed	Power Setting*
Cruise	47 KIAS	1600 RPM
Landing	41 KIAS	2000 RPM

**Power settings may vary based upon aircraft loading and density altitude.*

7. Maintain target airspeed +5 KIAS, -0 KIAS.
8. Turns, climbs, and descents should be practiced.
9. To recover:
   a. Smoothly apply full power and apply rudder smoothly to maintain heading and coordination.
   b. Turn carburetor heat OFF.
   c. Adjust the pitch and trim accordingly to maintain altitude.
   d. Retract the flaps to 20°.
   e. Retract the remaining flaps gradually.
10. After the maneuver is complete, trim the aircraft for cruise.

Steep Turns

Objective: To develop smoothness, coordination, orientation, division of attention, and control techniques while executed high-performance turns.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 2000' AGL.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
5. Note the pitch attitude for level flight.
6. Roll into the specified bank angle (Private 45°, Commercial 50°).
7. As the aircraft rolls through 30° of bank:
   a. Add power to maintain airspeed.
   b. Increase back pressure to maintain altitude.
   c. Note the position of the nose relative to the horizon.
8. Trim should be used to relieve back pressure.
9. Begin rolling out of your turn approximately 1/2 the bank angle before your reference point.
10. As the aircraft rolls through 30° of bank:
    a. Reduce the power to maintain airspeed (2300 RPM)
    b. Decrease back pressure to maintain altitude.
11. Repeat steps 6-10 for the turn in the opposite direction.
12. After the maneuver is complete, trim the aircraft for cruise.

Note: Private Pilots do not need to connect the first and second turn. The first turn may be made after which, the student may take time to set up for the second turn. Commercial pilots must complete the second turn immediately after the first.

Power-Off Stall

Objective: To teach the student to recognize the indications of an imminent or full stall during power off situations and to make prompt, positive, and effective recoveries with a minimum loss of altitude.

Procedure:

1. Perform this maneuver so that the recovery is completed at or above 2000' AGL.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 1500 RPM and turn carburetor heat ON.
5. Below 110 KIAS, extend flaps to 10°; below 85 KIAS, extend to full.
   a. Adjust pitch to maintain altitude as flaps are extended.
6. Maintain altitude until 60 KIAS and then establish a stabilized descent attitude at 60 KIAS.
7. Reduce power to idle while increasing pitch to V_y attitude.
8. Announce each of the three indications of a stall.
9. At the stall:
   a. Verbally announce the stall.
   b. Lower the pitch attitude sufficiently to break the stall.
   c. Use the rudder to maintain directional control.
   d. Maintain neutral ailerons.
   e. Add full power and turn carburetor heat OFF.
   f. Set flaps to 20°.
10. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
11. As the aircraft accelerates through 60 KIAS, retract the flaps.
12. Upon reaching the specified recovery altitude, trim the aircraft for cruise.

Note: This maneuver should be practiced at bank angles of 0-20°.

Power-On Stall

Objective: To teach the students to recognize the indications of an imminent or full stall during power on situations and to make prompt, positive, and effective recoveries with a minimum loss of altitude.

Procedure:

1. Perform this maneuver so that the recovery is completed at or above 2000' AGL.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 1500 RPM and turn carburetor heat ON.
5. Adjust pitch to maintain altitude.
6. At 55 KIAS, increase throttle to full power and turn carburetor heat OFF.
   a. Add right rudder as necessary to maintain coordination.
7. Slowly increase pitch to an attitude which will induce a stall.
8. Verbally announce each of the three indications of a stall.
9. At the stall:
   a. Verbally announce the stall.
   b. Lower the pitch attitude sufficiently to break the stall.
   c. Use the rudder to maintain directional control.
   d. Maintain neutral ailerons.
   e. Verify full power.
   f. Verify flaps up.
10. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
11. As the aircraft accelerates through 65 KIAS, lower the pitch to V_y attitude.
12. Upon reaching the specified recovery altitude, and trim the aircraft for cruise.

Note: This maneuver should be practiced at bank angles of 0-20°.

Secondary Stall

Objective: To teach the student to recognize the effects of improper control usage after initiating recovery from a stall.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Set up as either a Power-On or Power-Off Stall.
5. Verbally announce each of the three indications of a stall.
6. At the stall:
   a. Verbally announce the stall.
   b. Lower the pitch attitude sufficiently to break the stall.
   c. Use the rudder to maintain directional control.
   d. Maintain neutral ailerons.
   e. Add or maintain full power.
7. Before recovery, increase pitch attitude for a secondary stall.
8. At the stall:
   a. Verbally announce the stall.
   b. Lower the pitch attitude sufficiently to break the stall.
   c. Use the rudder to maintain directional control.
   d. Maintain neutral ailerons.
   e. Add or maintain full power.
   f. Set flaps to 20°.
9. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
10. As the aircraft accelerates through 60 KIAS, lower the pitch to V_y attitude and incrementally retract flaps 20° (if extended).
11. Upon reaching the specified recovery altitude, trim the aircraft for cruise.

Elevator Trim Stall

Objective: To teach the student the effects of not maintaining positive airplane control during a go-around.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Reduce power to 1500 RPM and turn carburetor heat ON.
5. Below 110 KIAS, extend flaps to 10°; below 85 KIAS, extend to full.
   a. Adjust pitch to maintain altitude as flaps are extended.
6. Maintain altitude until 60 KIAS and then establish a stabilized approach attitude at 60 KIAS and trim to maintain attitude.
7. Add full power and turn carburetor heat OFF:
   b. Allow the pitch to increase to approximately V_x pitch attitude.
   c. Allow the aircraft to roll left.
8. Verbally announce each of the three indications of a stall.
9. When the stall is imminent:
   d. Verbally announce the stall.
   e. Lower the pitch attitude sufficiently to break the stall.
   f. Use the rudder to prevent a spin.
   g. Maintain neutral ailerons.
   h. Set flaps to 20°.
   i. Trim the aircraft.
10. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
11. As the aircraft accelerates through 60 KIAS, retract the flaps.
12. Upon reaching the specified recovery altitude, trim the aircraft for cruise.

Cross-Control Stall

Objective: To teach the student the effects of not maintaining positive airplane control during a go-around.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete CRAGS.
3. Reduce power to 1500 RPM and turn carburetor heat ON.
4. At 60 KIAS, reduce power to idle.
5. Roll into a left or right bank not to exceed 30°.
6. Apply excessive rudder in the direction of turn and use opposite aileron to maintain bank angle.
7. Pitch the nose up above the horizon.
8. Verbally announce each of the three indications of a stall.
9. When the stall is imminent:
   a. Verbally announce the stall.
   b. Lower the pitch attitude slightly below a level pitch attitude.
   c. Use coordinated control inputs to maintain directional control and level the wings.
   d. Add full power and turn carburetor heat OFF.
10. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
11. Upon reaching the specified recovery altitude, trim the aircraft for cruise.

Note: Never perform this maneuver with flaps extended.

Accelerated Stall

Objective: To show the student that a stall is a function of angle of attack rather than airspeed.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 3000' AGL.
2. Complete CRAGS.
3. Reduce power to 1500 RPM and turn carburetor heat ON.
4. At 67 KIAS (20 KIAS above Vs):
   a. Adjust pitch to maintain altitude.
   b. Establish 45° of bank.
   c. Smoothly increase back pressure until the onset of the stall (buffet).
5. At the buffet:
   d. Verbally announce the onset of the stall.
   e. Lower the pitch attitude slightly below a level pitch attitude.
   f. Use coordinated control inputs to maintain directional control and level the wings.
   g. Add full power and turn carburetor heat OFF.
6. Adjust the pitch to an attitude that allows a positive rate of climb and an increase in airspeed to V_y.
7. Upon reaching the specified recovery altitude, trim the aircraft for cruise.

Note: Never perform this maneuver with flaps extended.

Spins

Objective: To develop the student's ability to recognize, recover from, and enter spins.

Procedure:

1. Perform this maneuver so that recovery takes place at or above 4,000 AGL.
2. Complete CRAGS.
3. Reduce power to idle while raising the nose of the aircraft to an attitude which will induce a stall.
   a. Turn the carburetor heat ON.
4. At the buffet:
   a. Apply full rudder in the direction of the desired rotation.
   b. Apply full up elevator.
   c. Ensure that the throttle is at idle.
5. At the completion of three full rotations:
   a. Ensure that the throttle is at idle.
   b. Neutralize the ailerons.
   c. Apply and HOLD full rudder opposite of the direction of rotation.
   d. Move the control wheel briskly forward just enough to break the stall.
   e. Hold these control inputs until the rotation stops.
   f. As the rotations stops, neutralize the rudder and make a smooth recovery from the resulting dive.
6. After the completion of the maneuver, increase power to 2300 RPM, turn the carburetor heat OFF, and trim the aircraft for cruise.

Note: This maneuver is only authorized in the CFI course.

Note: Weight and balance computations must be performed to assure the aircraft is in the utility category.

Chandelles

Objective: To develop the pilots coordination, orientation, planning, and feel for maximum performance flight and to develop positive control techniques at varying airspeeds and attitudes.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 2000' AGL.
2. Complete CRAGS.
3. Set power to 2300 RPM.
4. Perform this maneuver at or below maneuvering speed.
5. Pick a 90° reference point off of the aircrafts wing tip.
6. Roll the aircraft into 30° of bank:
   a. Add full throttle
7. Increase pitch gradually as to reach a maximum nose up attitude at the predetermined reference point.
8. At the reference point, slowly start to decrease the bank angle.
9. Increase back pressure as airspeed decreases to maintain a constant pitch attitude.
10. As the aircraft reaches a heading which places the reference point on the opposite wing, the bank angle should be 0°.
11. The pitch attitude should be held momentarily while the aircraft is at the minimum controllable airspeed (just above stall speed).
12. Maintain altitude and heading as airspeed increases to cruise.
13. After the maneuver is complete, trim the aircraft for cruise.

Lazy Eights

Objective: To develop the pilots feel for varying control forces and the ability to plan and remain oriented while maneuvering the aircraft with positive and accurate control.

Procedure:

1. Perform this maneuver so that the recovery takes place at or above 2000' AGL.
2. Complete CRAGS.
3. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
4. Pick a 45°, 90°, and 135° reference point.
5. Slowly increase bank and pitch to the 45° point.
6. At the 45° point:
   a. 15° of bank.
   b. Maximum pitch up.
7. Continue to increase bank while decreasing pitch to the 90° point.
8. At the 90° point:
   a. 30° of bank.
   b. Level pitch.
9. After the 90° point:
   a. Slowly decreased bank angle while decreasing pitch attitude.
10. At the 135° point:
    a. 15° of bank.
    b. Maximum pitch down.
11. At 180° point:
    a. Continue to decrease bank angle to achieve wings level while increasing pitch attitude to the entry pitch attitude.
12. Repeat items 5-12 in the opposite direction.
13. After the maneuver is complete, trim the aircraft for cruise.

Steep Spiral

Objective: To teach the students to demonstrate smoothness, coordination, orientation, division of attention, and control techniques in the performance of Steep Spirals.

Procedure:

1. Select an altitude sufficient to continue through a series of at least three 360° turns.
2. Complete CRAGS.
3. Pick a visual reference point to assist in maintaining heading.
4. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
5. Select a suitable ground reference point.
6. Abeam the reference point, close the throttle and turn carburetor heat ON.
   a. Altitude should be maintained as the aircraft slows to best glide speed +10 KIAS.
   b. Maintain best glide speed +10 KIAS throughout the duration of the maneuver.
7. Apply wind-drift correction to track a constant radius circle around the selected reference point with a bank angle not to exceed 60° at steepest point in the turn.
8. Divide your attention between the airplane control and ground track while maintaining coordinated flight.
9. Upon completion of each 360° turn, momentarily advance half throttle to clear the engine.
10. Maintain the specified airspeed, +/-10 KIAS, and roll out facing the predetermined visual reference point +/-10°.
11. After the maneuver is complete, trim the aircraft for cruise.

Note: Unless flown in conjunction with a simulated engine failure, recovery should take place no lower than 1000' AGL.

Rectangular Course

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete CRAGS.
2. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
3. Determine the wind direction.
4. Select a rectangular area from which an emergency landing can be made should the need arise.
5. Plan to enter the maneuver for either a left or right pattern.
6. Enter the maneuver at 800-1000' AGL.
7. Enter the downwind on a 45° angle.
8. Throughout the maneuver, establish a crab angle to maintain a uniform distance around the rectangular reference area at approximately 1/2 mile.
9. Very the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
10. At least one lap of the rectangle is required though more may be completed for practice purposes.
11. After the maneuver is complete, trim the aircraft for cruise.

Turns Around A Point

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete CRAGS.
2. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
3. Determine the wind direction.
4. Select a reference point from which an emergency landing can be made should the need arise.
5. Enter the maneuver at 800-1000' AGL.
6. Recommended entry for the maneuver is on the downwind.*
7. Begin the turn once the wing is abeam the point.
8. Very the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
   a. The steepest bank angle should not exceed 45°.
9. At least one lap of the maneuver is required though more may be completed for practice purposes.
10. After the maneuver is complete, trim the aircraft for cruise.

**Note: At the discretion of the flight instructor, entries other than those made on the downwind shall be practiced to verify the understanding of the relationship between groundspeed and required bank angle.*

S-Turns Across A Road

Objective: To teach the student to plan and correct for the effects of wind while maneuvering the aircraft over a predetermined ground path.

Procedure:

1. Complete CRAGS.
2. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
3. Determine the wind direction.
4. Select a reference line that is perpendicular to the wind which allows for a power off glide to a suitable landing field.
5. Enter the maneuver at 800-1000' AGL.
6. Enter the maneuver on the downwind.
7. Begin the turn back towards the reference line once the wing is abeam the reference line.
8. Very the bank angle as appropriate based upon groundspeed to maintain a constant radius during the turns.
   a. Adjust the pitch attitude to maintain altitude.
   b. The steepest bank angle should not exceed 45°.
9. The wings should be level and in transit to the opposite direction turn as the aircraft crosses the reference line.
10. Repeat steps 7-9 in the opposite direction.
11. After the maneuver is complete, trim the aircraft for cruise.

Eights-On-Pylons

Objective: To teach the student to maneuver an aircraft at a pivotal altitude around ground reference points while maintaining division of attention, coordination, and smooth control inputs.

Procedure:

1. Complete CRAGS.
2. Perform this maneuver at or below maneuvering speed.
   a. 2300 RPM should yield approximately 90 KIAS.
3. Determine the wind direction.
4. Select two reference points perpendicular to the wind direction from which an emergency landing can be made should the need arise.
5. Determine the pivotal altitude by squaring the ground speed and dividing the result by 11.3.
6. Enter the maneuver 45° to the downwind.
7. Once abeam the pylon, begin the turn.
   a. The steepest bank angle should not exceed 40°.
8. Vary altitude to maintain the reference line on the pylon.
   a. Pylon forward - pitch down and reduce bank angle.
   b. Pylon rearward - pitch up and increase bank angle.
9. Plan rollout from first pylon to allow for a 45° entry an 3-5 seconds of level flight to the next pylon.
10. Once abeam the second pylon, begin to turn in the opposite direction.
11. After completing the turn around the second pylon, depart the maneuver on the entry heading.
12. After the maneuver is complete, trim the aircraft for cruise.

$H = \frac{v^2}{11.3}$	**GS**	80	85	90	95	100	105	110	115
	Pivotal Altitude	557	628	716	799	885	976	1,071	1,170

Loss of 02 Emergency Descent

Objective: To develop the student's ability to descend the airplane as rapidly as possible, within the limitations of the airplane.

Procedure:

1. Brief passengers on the maneuver.
2. Complete CRAGS.
3. Reduce power to idle and turn carburetor heat ON.
4. Lower the pitch of the aircraft while rolling into a 45° bank.
5. Adjust the pitch of the aircraft to maintain 100 KIAS.
6. Roll out of the maneuver after 90° of heading change by first rolling wings level and then pitching up.
7. Use a 30° S-turn to clear the area.
8. Smoothly advance the throttle to 2300 RPM and turn carburetor heat OFF.
9. After the maneuver is complete, trim the aircraft for cruise.

Note: Enriching of the mixture may be required at the end of the maneuver PRIOR to advancing the throttle.

Note: This maneuver is permitted only on dual flights.

Note: Recover no lower than 500' AGL.

Caution: Do NOT exceed V_{no} *unless in smooth air. Use* V_a *when necessary.*

Engine Fire Emergency Descent

Objective: To develop the students ability to descend the airplane as rapidly as possible, within the limitation of the airplane.

Procedure:

1. Brief passengers on the maneuver.
2. Complete CRAGS.
3. Simulate the Engine Fire checklist.
4. Reduce power to idle and turn carburetor heat ON.
5. Lower the pitch of the aircraft while rolling into a 45° bank.
6. Adjust the pitch of the aircraft to maintain 100 KIAS.
7. Roll out of the maneuver after 90° of heading change by first rolling wings level and then pitching up.
8. Use a 30° S-turn to clear the area.
9. Smoothly advance the throttle to 2300 RPM and turn carburetor heat OFF.
10. After the maneuver is complete, trim the aircraft for cruise.

Note: Enriching of the mixture may be required at the end of the maneuver before advancing the throttle.

Note: This maneuver is permitted only on dual flights.

Note: Recover no lower than 500' AGL.

Caution: Do NOT exceed V_{no} *unless in smooth air. Use* V_a *when necessary.*

Diversion

Objective: To develop skills necessary for plotting a new course and determining a new ETA while en route.

Procedure:

1. When diverting to a nearby airport (25 NM or less) and fuel is not critical, students will be expected to make estimates with a reasonable degree of accuracy rather than actual computations.
2. Note the starting position and time.
3. Determine location of new destination.
4. Turn into an estimated heading that will avoid any restricted or special use airspace, obstructions, or adverse weather.
5. Select some prominent landmarks to aid in flying the new course.
6. Determine distance and magnetic heading.
7. Compute ETE, ETA, fuel required, and compass heading.
8. Amend the flight plan with the appropriate Flight Service Station.
   a. The pilot should check all applicable NOTAMs and TFRs for the diversion airport as well as the surrounding airspace.
9. Brief new destination airport information.

Lost Procedures

Objective: To gain proficiency in determining aircraft position and the corrections needed to reestablish the aircraft on course.

Procedure:

1. If unable to determine aircrafts position, complete the 6 C's.
   a. CONFESS - Admit to yourself that you are lost.
   b. CONSERVE - Reduce throttle and lean the mixture to get better fuel economy.
   c. CLIMB - Climb to avoid obstructions, increase visibility, and improve radio reception.
   d. CIRCLE - Pick a nearby landmark and stay in its general vicinity.
      i. Use topographical features and/or electronic navigation to determine your position.
         A. Topographical features:
            I. Align the directional gyro with the magnetic compass.
            II. Turn the sectional chart to match your heading.
            III. Look outside to find prominent landmarks.
            IV. Match the landmarks to the chart.
         B. Electronic Navigation:
            I. Align the directional gyro with the magnetic compass.
            II. If using GPS, select the nearest USABLE airport and initiate the Direct To function.
            III. If using a ground based Navaid, tune and identify the appropriate available station or stations and determine approximate location.
      ii. If location is determined, return to the original course or initiate a diversion.
   e. COMMUNICATE - Talk to ATC or FSS.
   f. COMPLY - Follow ATC or FSS instructions.

Normal Approach and Landing

Objective: To develop the students ability to safely and accurately land the airplane in a designated area.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. On the Final leg:
   a. Set the flaps to the full position (30-40° depending on serial number).
   b. Adjust pitch and power to maintain the descent to touchdown point at 60 KIAS.
      i. Add 1/2 gust factor as necessary.
3. Once landing is assured, reduce power to idle and continue the flare to touchdown on the main tires within 200' beyond a specified point.
4. Hold the nose gear off of the runway with back-pressure.
5. After the nose wheel has touched the ground, gently apply brakes while maintaining runway centerline.

Crosswind Approach and Landing

Objective: To develop the students ability to safely land the aircraft on the ground during crosswind conditions.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. Note the wind direction and speed.
3. On the Final leg:
   a. Set the flaps as appropriate to the wind speed.
   b. Ensure that the airspeed is slightly faster than for a normal landing.
      i. Add 1/2 gust factor as necessary.
4. Maintain runway centerline and directional control with a “Side Slip.”
5. Once landing is assured, reduce power to idle and continue the flare to touchdown on the main tires.
6. Land on the upwind main tire first within 200’ beyond a specified point and then set the downwind main tire down on the runway in a controlled and deliberate manner.
7. Hold the nose gear off of the runway with back-pressure.
8. After the nose wheel has touched the ground, gently apply brakes while maintaining runway centerline.
9. Adjust the ailerons to keep the wings level during the ground roll.
10. Continue the appropriate crosswind correction for all taxi operations.

Note: With less than full flaps, the airplane will be in a higher nose-up attitude.

Note: Commercial students will be required to demonstrate the “Crab and Kick” technique of Crosswind Landing.

Short Field Approach and Landing

Objective: To teach the students how to obtain maximum performance from the aircraft so that the landing may be consistently accomplished with precision in a short distance.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. On the Final leg:
   a. Set the flaps to the full position (30-40° depending on serial number).
   b. Adjust pitch and power to maintain the descent to touchdown point at 60 KIAS.
      i. Add 1/2 gust factor as necessary.
3. Maintain the predetermined aiming point with pitch and power corrections until approaching the round out.
4. Once landing is assured, reduce the power to idle and continue the flare to touchdown at the predetermined point within 100' on the main tires first.
5. In a controlled and deliberate manner, lower the nose gear to the runway.
6. After the nose wheel has touched the ground, apply full back pressure with the yoke.
7. Retract the flaps to zero.
8. Smoothly apply maximum braking without locking up the wheels and maintain runway centerline.

Note: This maneuver is NOT complete until the aircraft has come to a COMPLETE stop.

Note: Approach speed should be increased as required (typically 5 to 15 KIAS) if turbulence or wind shear conditions exist.

Soft Field Approach and Landing

Objective: To teach the student to obtain maximum performance from the airplane so that a soft touchdown at the slowest possible airspeed can be accomplished.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. On the Final leg:
   a. Set the flaps to the full position (30-40° depending on serial number).
   b. Adjust pitch and power to maintain the descent to touchdown point at 60 KIAS.
      i. Add 1/2 gust factor as necessary.
3. A slight amount of power should be maintained during touchdown.
4. Close the throttle during the rollout.
5. Hold the nose gear off of the runway with back pressure.
6. The flaps should remain extended until clear of the runway.
7. After the nose wheel has touched the ground, maintain the runway centerline and do NOT apply brakes.
8. Maintain elevator back pressure while taxiing on a soft surface.

Note: This maneuver is NOT complete until the aircraft is clear of the runway.

Note: Approach speed should be increased as required (typically 5 to 15 KIAS) if turbulence or wind shear conditions exist.

Power-Off 180°

Objective: To teach the student to develop judgement in estimating distances and glide ratios to accurately touch down on a previously chosen point on the runway.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. When the aircraft is abeam the point of intended landing, reduce the throttle to idle, turn carburetor heat ON, and maintain altitude until reaching best glide speed.
3. Use the flaps as necessary to maintain desired descent gradient.
4. At the round out, continue the flare to touchdown on the main tires first.
5. Touch down within 200’ beyond a specified point.
6. In a controlled and deliberate manner, lower the nose gear to the runway.
7. Retract the flaps to zero.
8. After the nose wheel has touched the ground, gently apply brakes while maintaining runway centerline.

Forward Slip To Landing

Objective: To teach the student to dissipate altitude without increasing the airplane's speed during a forward slip to landing.

Procedure:

1. Fly the traffic pattern following the Traffic Pattern Operations procedure on page 6 of this document.
2. Do not descend below 500' AGL until the Final leg.
3. On the Final leg:
   a. Reduce the throttle to idle.
   b. Note the wind direction.
   c. Smoothly apply full rudder in the opposite direction of the wind.
   d. Use opposite aileron to slip into the wind.
   e. Fly at an airspeed of 60 KIAS.
   f. Add 1/2 gust factor as necessary.
4. At the round out, align the airplane with the runway centerline by releasing rudder pressure and adjust the ailerons as necessary to keep the wings level.
5. Flare to touch down on the main wheels first within 400' beyond a specified point.
6. After the nose wheel is down, gently apply brakes.

Note: Because of the location of the pitot tube and static port, the airspeed indicator may have a considerable degree of error.

Go-Around

Objective: To teach the student to discontinue the approach and attempt another approach under more favorable conditions.

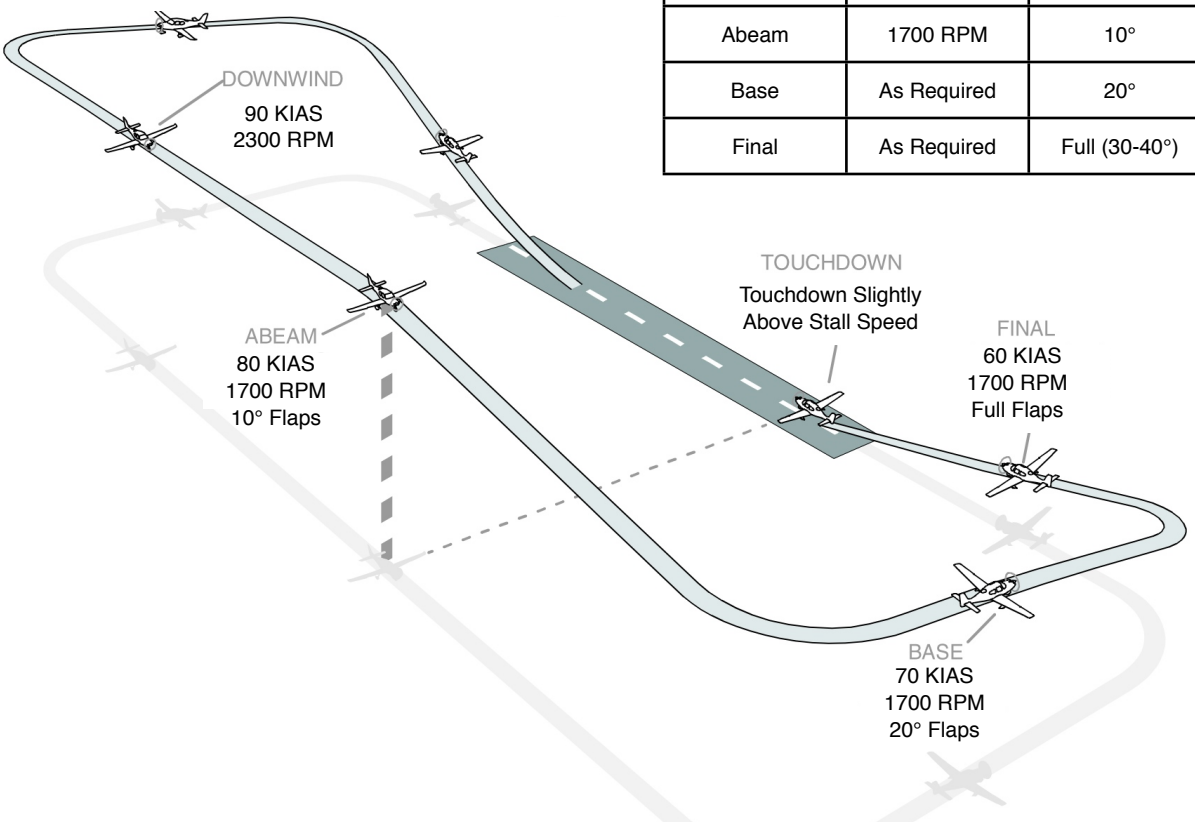
Procedure:

1. Should the decision be made to go-around, the following should be accomplished in order:
   a. Smoothly increase the throttle to the full open position and turn carburetor heat OFF.
   b. Retract the flaps to 20°.
   c. Pitch up to an attitude which will obtain 55 KIAS.
   d. Retract the remaining flaps incrementally once a positive rate of climb has been established.
   e. Accelerate to V_y.
2. At traffic patter altitude, lower pitch to a level flight attitude and adjust power as necessary (approximately 2300 RPM) to maintain 90 KIAS.
3. To depart the pattern, continue straight out, or exit with a 45° turn in the direction of the traffic pattern.
4. At 1000' AGL, complete the climb checklist.

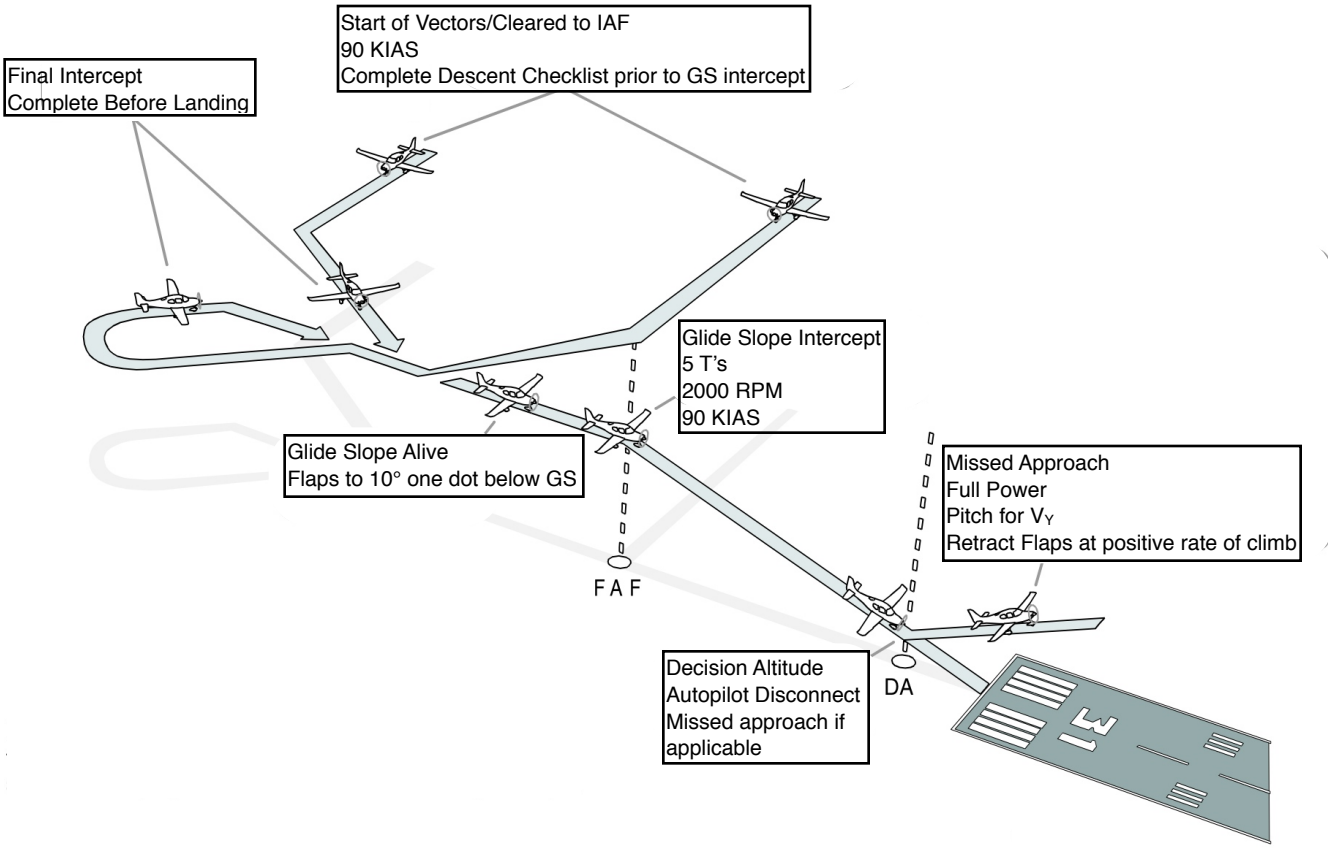
Note: The earlier a dangerous situation is recognized, the sooner a decision to reject the landing and begin a go-around, the safer the maneuver will be.

Traffic Pattern

	Power	Flaps
Downwind	2300 RPM	0°
Abeam	1700 RPM	10°
Base	As Required	20°
Final	As Required	Full (30-40°)



Precision Approach



Non-precision Approach

