

North Star Flight Maneuvers

Piper Archer: Private, Commercial, & CFI



Private Pilot Maneuvers

Slow Flight (Landing Configuration)

Set up:

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Recovery:

1. Throttle – Max Power

2. Reduce Angle of Attack

3. Maintain Altitude

4. Flaps 25°

5. Maintain Altitude – accelerate to 64 KIAS – Flaps 10°

6. Maintain Altitude – accelerate to 76 KIAS –

Flaps 0°

KIAS

7. Maintain Altitude – return to Cruise Flight 100



Testing standards:

Skills:	The applicant exhibits the skill to:
PA.VII.A.S1	Clear the area.
PA.VII.A.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
PA.VII.A.S3	Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., aircraft buffet, stall horn, etc.).
PA.VII.A.S4	Accomplish coordinated straight-and-level flight, turns, climbs, and descents with the aircraft configured as specified by the evaluator without a stall warning (e.g., aircraft buffet, stall horn, etc.).
PA.VII.A.S5	Maintain the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 knots; and specified angle of bank, ±10°.

*Target Airspeed will change based on current conditions R25S



Slow Flight (Takeoff Configuration)

Set up:

- 1. Altitude 2,000' AGL Minimum
- 2. Pre-maneuver Check Complete
- 3. Throttle 1500 RPM
- 4. Pitch to Maintain Altitude
- 5. Throttle Increase to Maintain Altitude (1800-2000 RPM)
- 6. Pitch Maintain Target Airspeed : 55 KIAS* Private: +10/-0 Kts
- 7. Trim Adjust as Necessary

Recovery:

- 1. Throttle Max Power
- 2. Reduce Angle of Attack
- 3. Maintain Altitude
- 4. 64 KIAS Positive Rate Verify Flaps Up
- 5. Maintain Altitude accelerate to 76 KIAS Flaps 0°
- 6. Return to Cruise Flight 100 KIAS



Testing standards:

Skills:	The applicant exhibits	the skill to):
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- PA.VII.A.S1 Clear the area.
- PA.VII.A.S2 Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
- PA.VII.A.S3 Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., aircraft buffet, stall horn, etc.).
- PA.VII.A.S4 Accomplish coordinated straight-and-level flight, turns, climbs, and descents with the aircraft configured as specified by the evaluator without a stall warning (e.g., aircraft buffet, stall horn, etc.).
- *PA.VII.A.S5* Maintain the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 knots; and specified angle of bank, ±10°.

*Target Airspeed will change based on current conditions R25S



Power Off Stalls (Landing Configuration)

Set up:

- 1. Altitude 2,000' AGL Minimum
- 2. Pre-maneuver Check Complete
- 3. Throttle 1700 RPM
- 4. Pitch to Maintain Altitude
- 5. Below 102 KIAS Flaps 10°, 25°, 40°
 - (one notch at a time)
- 6. Enter a Normal Descent to Land 70 KIAS & 500 FPM
- 7. Throttle Idle
- 8. Simulate Round out to flare
 - (8°-10°, or nose to the horizon)

Recovery:

1. Reduce Angle of Attack

- 2. Roll Wings Level
- 3. Throttle Max Power
- 4. Flaps Flaps 25°
- 5. Establish a Climb pitching for 64KIAS
- 6. 64 KIAS Positive Rate Flaps 10°
- 7. 76KIAS Positive rate Flaps 0°
- 8. Continue to climb at 76KIAS until specified altitude



Testing standards:

Skills:	The applicant exhibits the skill to:
PA.VII.B.S1	Clear the area.
PA.VII.B.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
PA.VII.B.S3	Configure the airplane in the approach or landing configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
PA.VII.B.S4	Establish a stabilized descent.
PA.VII.B.S5	Transition smoothly from the approach or landing attitude to a pitch attitude that induces a stall.
PA.VII.B.S6	Maintain a specified heading ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10° if in turning flight, while inducing the stall.
PA.VII.B.S7	Acknowledge cues of the impending stall and then recover promptly after a full stall occurs.
PA.VII.B.S8	Execute a stall recovery in accordance with procedures set forth in the Pilot's Operating Handbook (POH) or Airplane Flight Manual (AFM).
PA.VII.B.S9	Configure the airplane as recommended by the manufacturer, and accelerate to best angle of climb speed (V _x) or best rate of climb speed (V _y).
PA.VII.B.S10	Return to the altitude, heading, and airspeed specified by the evaluator.

PA.VII.B.S11 Use single-pilot resource management (SRM) or crew resource management (CRM), as appropriate





Power On Stalls (Takeoff Configuration)



Set up:

- 1. Altitude 2,000' AGL Minimum
- 2. Pre-maneuver Check Complete
- 3. Throttle 1500 RPM
- 4. Pitch to Maintain Altitude
- 5. 64 KIAS Max Power
- 6. Smoothly Increase Pitch to Induce a Stall (No More than 20° pitch up)

Recovery:

- 1. Reduce Angle of Attack
- 2. Roll Wings Level
- 3. Throttle Max Power
- 4. Establish a Climb pitching for 64KIAS
- 5. Maintain Altitude not exceeding 10° pitch up.
- 6. 64KIAS Positive rate Verify Flaps 0°
- 7. Accelerate 76KIAS
- 8. Continue to climb at 76KIAS until specified altitude



- Skills: The applicant exhibits the skill to:
- PA.VII.C.S1 Clear the area.
- PA.VII.C.S2 Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
- PA.VII.C.S3 Establish the takeoff, departure, or cruise configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
- PA.VII.C.S4 Set power (as assigned by the evaluator) to no less than 65 percent power.
- PA. VII.C.S5 Transition smoothly from the takeoff or departure attitude to the pitch attitude that induces a stall.
- $\label{eq:particular} \textit{PA.VII.C.S6} \qquad \text{Maintain a specified heading, $\pm10^\circ$ if in straight flight; maintain a specified angle of bank not to exceed 20°, $\pm10^\circ$ if in turning flight, while inducing the stall.}$
- PA.VII.C.S7 Acknowledge cues of the impending stall and then recover promptly after a full stall occurs.
- PA.VII.C.S8 Execute a stall recovery in accordance with procedures set forth in the Pilot's Operating Handbook (POH)/Flight Manual (FM).
- $\label{eq:PA.VII.C.S9} \begin{array}{c} \mbox{Configure the airplane as recommended by the manufacturer, and accelerate to best angle of climb speed (V_{\chi}) or best rate of climb speed (V_{\gamma}). \end{array}$
- PA.VII.C.S10 Return to the altitude, heading, and airspeed specified by the evaluator.
- PA.VII.C.S11 Use single-pilot resource management (SRM) or crew resource management (CRM), as appropriate.

Steep Turn

- 1. Altitude 2,000' AGL Minimum
- 2. Pre-Maneuver Check Complete
- 3. Throttle 2300-2400RPM
- 4. Airspeed 100 KIAS
- 5. Bank Private(45°)
- 6. Trim Roll Aft to Relieve Bank Pressure
- 7. Power Increase to Maintain Altitude
- 8. Roll Out Initial Heading +/- 10°
- 9. Repeat Procedures in the opposite direction as specified by instructor
- 10. Return to Cruise Flight 100 KIAS

Testing standards:

Skills: The applicant exhibits the skill to: PA.V.A.S1 Clear the area. PA.V.A.S2 Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed the maneuvering speed (V _A). PA.V.A.S3 Roll into a coordinated 360° steep turn with approximately a 45° bank. PA.V.A.S4 Perform the Task in the opposite direction, as specified by evaluator. PA.V.A.S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°.		
 PA. V.A. S1 Clear the area. PA. V.A. S2 Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed the maneuvering speed (V_A). PA. V.A. S3 Roll into a coordinated 360° steep turn with approximately a 45° bank. PA. V.A. S4 Perform the Task in the opposite direction, as specified by evaluator. PA. V.A. S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. 	Skills:	The applicant exhibits the skill to:
 PA. V.A. S2 Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed the maneuvering speed (V_A). PA. V.A. S3 Roll into a coordinated 360° steep turn with approximately a 45° bank. PA. V.A. S4 Perform the Task in the opposite direction, as specified by evaluator. PA. V.A. S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. 	PA.V.A.S1	Clear the area.
 PA. V.A. S3 Roll into a coordinated 360° steep turn with approximately a 45° bank. PA. V.A. S4 Perform the Task in the opposite direction, as specified by evaluator. PA. V.A. S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. 	PA.V.A.S2	Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed the maneuvering speed (V_A) .
 PA.V.A.S4 Perform the Task in the opposite direction, as specified by evaluator. PA.V.A.S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. 	PA.V.A.S3	Roll into a coordinated 360° steep turn with approximately a 45° bank.
PA.V.A.S5 Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°.	PA.V.A.S4	Perform the Task in the opposite direction, as specified by evaluator.
	PA.V.A.S5	Maintain the entry altitude ± 100 feet, airspeed ± 10 knots, bank $\pm 5^{\circ}$, and roll out on the entry heading $\pm 10^{\circ}$.





S-Turns

- 1. Altitude 600' to 1,000' AGL
- 2. Pre-maneuver Check Complete
- 3. Throttle 2200RPM
- 4. Airspeed 100 KIAS
- 5. Bank Increased bank angle with tail wind Decreased bank angle with headwind
- 6. Trim As required to stay at selected altitude
- 7. Power Set
- 8. Roll Out Initial Heading +/- 10° One mile from original heading
- 9. Continue Procedures in the same direction
- 10. Return to Normal Flight 100 KIAS

- Skills:The applicant exhibits the skill to:PA.V.B.S1Clear the area.PA.V.B.S2Select a suitable ground reference area, line, or point as appropriate.PA.V.B.S3Plan the maneuver:PA.V.B.S3bb. S-turns: enter perpendicular to the selected reference line, 600 to 1,000 feet AGL at an appropriate distance from the selected reference areaPA.V.B.S4Apply adequate wind-drift correction during straight and turning flight to maintain a constant ground track around a rectangular reference area, or to maintain a constant radius turn on each side of a selected reference line or point.
 - PA.V.B.S5 If performing S-Turns, reverse the turn directly over the selected reference line; if performing turns around a point, complete turns in either direction, as specified by the evaluator.
 - PA.V.B.S6 Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.
 - PA.V.B.S7 Maintain altitude ±100 feet; maintain airspeed ±10 knots.





Turns Around a Point

 Altitude – 800' to 1,000' AGL
 Pre-maneuver Check – Complete
 Throttle – 2200-2400RPM
 Airspeed – 100 KIAS
 Bank – Increased bank angle with tail wind Decreased bank angle with head wind
 Trim – As required to stay at selected altitude
 Power – Set
 Roll Out – Initial Heading +/- 10°
 Return to Normal Flight 100 KIAS

Skills:	The applicant exhibits the skill to:
PA.V.B.S1	Clear the area.
PA.V.B.S2	Select a suitable ground reference area, line, or point as appropriate.
PA.V.B.S3	Plan the maneuver:
PA.V.B.S3c	c. Turns around a point: enter at an appropriate distance from the reference point, 600 to 1,000 feet AGL at an appropriate distance from the selected reference area
PA.V.B.S4	Apply adequate wind-drift correction during straight and turning flight to maintain a constant ground track around a rectangular reference area, or to maintain a constant radius turn on each side of a selected reference line or point.
PA.V.B.S5	If performing S-Turns, reverse the turn directly over the selected reference line; if performing turns around a point, complete turns in either direction, as specified by the evaluator.
PA.V.B.S6	Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.





Rectangular Pattern

- 1. Altitude 800' to 1,000' AGL
- 2. Pre-maneuver Check Complete
- 3. Throttle 2200-2400RPM
- 4. Airspeed 100 KIAS
- 5. Enter 45° to Downwind
- 6. Crab to maintain course with ground reference
- 7. Exit on Downwind 45° right of downwind course
- 8. Return to Normal Flight 100 KIAS
- *Increased bank with tailwind, Decrease bank with headwind

Skills:	The applicant exhibits the skill to:
PA.V.B.S1	Clear the area.
PA.V.B.S2	Select a suitable ground reference area, line, or point as appropriate.
PA.V.B.S3	Plan the maneuver:
PA.V.B.S3a	 Rectangular course: enter a left or right pattern, 600 to 1,000 feet above ground level (AGL) at an appropriate distance from the selected reference area, 45° to the downwind leg
PA.V.B.S4	Apply adequate wind-drift correction during straight and turning flight to maintain a constant ground track around a rectangular reference area, or to maintain a constant radius turn on each side of a selected reference line or point.
PA.V.B.S5	If performing S-Turns, reverse the turn directly over the selected reference line; if performing turns around a point, complete turns in either direction, as specified by the evaluator.
PA.V.B.S6	Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.
PA.V.B.S7	Maintain altitude ± 100 feet; maintain airspeed ± 10 knots.





Recommended Reference materials:



Airplane Flying Handbook

- FAA-H-8083-3C
- Slow Flight
 - Ch5 pg. 9-12
- Power off Stalls
 - Ch5 pg. 12-17
- Power On Stalls
 - Ch5 pg. 12-17, 18
- Steeps Turns
 - Ch10 pg. 1-3
- S-Turns
 - Ch7 pg. 1-5, 8-10
- Turns Around a Point
 - Ch7 pg. 1-5, 7
- Rectangular Pattern
 - Ch7 pg. 1-7

Pilot's Handbook of Aeronautical Knowledge

- FAA-H-8083-25C
- Stalls
 - Ch5 pg. 25-26







PRIVATE PILOT MANEUVERS END



Commercial Pilot Maneuvers

Slow Flight (Landing Configuration)

 Altitude – 2,000' AGL Minimum
 Pre-maneuver Check – Complete
 Throttle – 1700 RPM
 Pitch to Maintain Altitude
 Below 102 KIAS – Flaps 10°, 25°, 40° (one notch at a time)
 Throttle – Increase to Maintain Altitude (1800-2000 RPM)
 Pitch – Maintain Stall Speed : 50 knots* Commercial: +5/-0 Kts

8. Trim – Adjust as Necessary

*Will vary on conditions

Recovery:

- 1. Throttle Max Power
- 2. Reduce Angle of Attack
- 3. Maintain Altitude
- 4. Flaps 25°
- 5. Maintain Altitude accelerate to 64 KIAS Flaps 10°
- 6. Maintain Altitude accelerate to 76 KIAS Flaps 0°
- 7. Maintain Altitude return to Cruise Flight 100 KIAS





Skills:	The applicant exhibits the skill to:
CA.VII.A.S1	Clear the area.
CA.VII.A.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
CA.VII.A.S3	Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., aircraft buffet, stall horn, etc.).
CA.VII.A.S4	Accomplish coordinated straight-and-level flight, turns, climbs, and descents with the aircraft configured as specified by the evaluator without a stall warning (e.g., aircraft buffet, stall horn, etc.).
CA.VII.A.S5	Maintain the specified altitude, ±50 feet; specified heading, ±10°; airspeed, +5/-0 knots; and specified angle of bank, ±5°.

Slow Flight (Takeoff Configuration)



 Altitude – 2,000' AGL Minimum
 Pre-maneuver Check – Complete
 Throttle – 1500 RPM
 Pitch to Maintain Altitude
 Throttle – Increase to Maintain Altitude (1800-2000 RPM)
 Pitch – Maintain Stall Speed : 55 KIAS* Commercial: +5/-0 Kts
 Trim – Adjust as Necessary

*Will vary on conditions

Recovery:

- 1. Throttle Max Power
- 2. Reduce Angle of Attack
- 3. Maintain Altitude
- 4. 64 KIAS Positive Rate Verify Flaps Up
- 5. Maintain Altitude accelerate to 76 KIAS Flaps 0°
- 6. Return to Cruise Flight 100 KIAS



Skills:	The applicant exhibits the skill to:
CA.VII.A.S1	Clear the area.
CA.VII.A.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
CA.VII.A.S3	Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., aircraft buffet, stall horn, etc.).
CA.VII.A.S4	Accomplish coordinated straight-and-level flight, turns, climbs, and descents with the aircraft configured as specified by the evaluator without a stall warning (e.g., aircraft buffet, stall horn, etc.).
CA.VII.A.S5	Maintain the specified altitude, ±50 feet; specified heading, ±10°; airspeed, +5/-0 knots; and specified angle of bank, ±5°.

Power Off Stalls (Landing Configuration)

North Star

1. Altitude – 2,000' AGL Minimum

- 2. Pre-maneuver Check Complete
- 3. Throttle 1700 RPM
- 4. Pitch to Maintain Altitude
- 5. Below 102 KIAS Flaps 10°, 25°, 40°
 - (one notch at a time)
- 6. Enter a Normal Descent to Land 70 KIAS & 500 FPM

7. Throttle – Idle

- 8. Simulate Round out to flare
 - (8°-10°, or nose to the horizon)
- 9. Begin recovery at first indication

Recovery:

1. Reduce Angle of Attack

- 2. Roll Wings Level
- 3. Throttle Max Power
- 4. Flaps Flaps 25°
- 5. Establish a Climb pitching for 64KIAS
- 6. 64 KIAS Positive Rate Flaps 10°
- 7. 76KIAS Positive rate Flaps 0°
- 8. Continue to climb at 76KIAS until specified altitude



Skills:	The applicant exhibits the skill to:
CA.VII.B.S1	Clear the area.
CA.VII.B.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
CA.VII.B.S3	Configure the airplane in the approach or landing configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
CA.VII.B.S4	Establish a stabilized descent.
CA.VII.B.S5	Transition smoothly from the approach or landing attitude to a pitch attitude that induces a stall.
CA.VII.B.S6	Maintain a specified heading, ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±5° if in turning flight, until an impending or full stall occurs, as specified by the evaluator.
CA.VII.B.S7	Acknowledge the cues at the first indication of a stall (e.g., aircraft buffet, stall horn, etc.).
CA.VII.B.S8	Recover at the first indication of a stall or after a full stall has occurred, as specified by the evaluator.
CA.VII.B.S9	Configure the airplane as recommended by the manufacturer, and accelerate to best angle of climb speed (V _x) or best rate of climb speed (V _y).
CA.VII.B.S10	Return to the altitude, heading, and airspeed specified by the evaluator.

Power On Stalls (Takeoff Configuration)



- 1. Altitude 2,000' AGL Minimum
- 2. Pre-maneuver Check Complete
- 3. Throttle 1500 RPM
- 4. Pitch to Maintain Altitude
- 5. 64 KIAS Max Power
- 6. Smoothly Increase Pitch to Induce a Stall (No More than 20° pitch)
- 7. Begin recovery at first indication



Recovery:

- 1. Reduce Angle of Attack
- 2. Roll Wings Level
- 3. Throttle Max Power
- 4. Establish a Climb pitching for 64KIAS
- 5. Maintain Altitude
- 6. 64KIAS Positive rate Verify Flaps 0°
- 7. Accelerate 76KIAS
- 8. Continue to climb at 76KIAS until specified altitude

Skills:	The applicant exhibits the skill to:
CA.VII.C.S1	Clear the area.
CA.VII.C.S2	Select an entry altitude that allows the Task to be completed no lower than 1,500 feet above ground level (AGL) (ASEL, ASES) or 3,000 feet AGL (AMEL, AMES).
CA.VII.C.S3	Establish the takeoff, departure, or cruise configuration, as specified by the evaluator, and maintain coordinated flight throughout the maneuver.
CA.VII.C.S4	Set power to no less than 65 percent power.

- CA.VII.C.S5 Transition smoothly from the takeoff or departure attitude to the pitch attitude that induces a stall.
- CA.VII.C.S6 Maintain a specified heading ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10° if in turning flight, until an impending or full stall is reached, as specified by the evaluator.
- CA.VII.C.S7 Acknowledge the cues at the first indication of a stall (e.g., aircraft buffet, stall horn, etc.).
- CA.VII.C.S8 Recover at the first indication of a stall or after a full stall has occurred, as specified by the evaluator.
- $\label{eq:calculation} CA.VII.C.S9 \qquad \mbox{Configure the airplane as recommended by the manufacturer, and accelerate to best angle of climb speed (V_{\chi}) or best rate of climb speed (V_{\chi}).$
- CA.VII.C.S10 Return to the altitude, heading, and airspeed specified by the evaluator.

Steep Turn

Altitude – 2,000' AGL Minimum
 Pre-maneuver Check – Complete
 Throttle – 2300-2400RPM
 Airspeed – 100 KIAS
 Bank – Commercial(50°)
 Trim – Roll Aft to Relieve Bank Pressure
 Power – Increase to Maintain Altitude
 Roll Out – Initial Heading +/- 10°
 Repeat Procedures in the opposite direction as necessary
 Return to Cruise Flight 100 KIAS





- Skills: The applicant exhibits the skill to:
- CA.V.A.S1 Clear the area.
- CA.V.A.S2 Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed maneuvering speed (V_A) .
- CA.V.A.S3 Roll into a coordinated 360° steep turn with approximately a 50° bank.
- CA.V.A.S4 Perform the Task in the opposite direction.
- CA.V.A.S5 Maintain the entry altitude ± 100 feet, airspeed ± 10 knots, bank $\pm 5^{\circ}$, and roll out on the entry heading $\pm 10^{\circ}$.

Accelerated Stall

Altitude – 3,000' AGL Minimum
 Pre-maneuver Check – Complete
 Enter 45-degree bank and power idle
 (Evaluator may specify different configurations)
 Pitch to Maintain Altitude
 Maintain altitude to induce Stall

Recovery:

Initiated at the first indication of stall

1. Smoothly reduce pitch

2. Bank – Wings Level with opposite aileron and rudder to maintain coordination

- 3. Power Increase to Max
- 4. Pitch for Vy (76 KIAS)

Verify Flaps 0°

5. Return to the altitude, heading, and airspeed as specified by the instructor

Testing standards:

Skills: The applicant exhibits the skill to: CA.VII.D.S1 Clear the area. CA.VII.D.S2 Select an entry altitude that allows the Task to be completed no lower than 3,000 feet above ground level (AGL). CA.VII.D.S3 Establish the configuration as specified by the evaluator. CA.VII.D.S4 Set power appropriate for the configuration, such that the airspeed does not exceed the maneuvering speed (V_{A}) or any other applicable Pilot's Operating Handbook (POH)/Airplane Flight Manual (AFM) limitation. CA.VII.D.S5 Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached. CA.VII.D.S6 Acknowledge the cues at the first indication of a stall (e.g., aircraft buffet, stall horn, etc.). CA.VII.D.S7 Execute a stall recovery in accordance with procedures set forth in the Pilot's Operating Handbook (POH)/Flight Manual (FM). CA.VII.D.S8 Configure the airplane as recommended by the manufacturer, and accelerate to best angle of climb speed (V_{v}) or best rate of climb speed (V_{v}). CA.VII.D.S9 Return to the altitude, heading, and airspeed specified by the evaluator.



Eights On Pylon

- 1. Airspeed 100KIAS
- 2. Pre-Maneuver Check Complete
- 3. Area Clear of Obstructions
- 4. Pivotal Altitude GS²/11.3
- 5. Enter 45° to Downwind
- 6. Pitch Maintain Pivotal Altitude
- 7. Perform 2 Revolutions, one around each point

Skills:	The applicant exhibits the skill to:
CA.V.E.S1	Clear the area.
CA.V.E.S2	Determine the approximate pivotal altitude.
CA.V.E.S3	Select suitable pylons that permits straight-and-level flight between the pylons.
CA.V.E.S4	Enter the maneuver in the correct direction and position using an appropriate altitude and airspeed.
CA.V.E.S5	Establish the correct bank angle for the conditions, not to exceed 40°.
CA.V.E.S6	Apply smooth and continuous corrections so that the line-of-sight reference line remains on the pylon.
CA.V.E.S7	Divide attention between accurate, coordinated airplane control and outside visual references.
CA.V.E.S8	Maintain pylon position using appropriate pivotal altitude, avoiding slips and skids.





Pivotal Altitude Chart		
Groundspeed	Pivotal Altitude	
60	319	
70	434	
80	566	
90	717	
100	885	
110	1071	
120	1274	
130	1496	

Lazy Eights

 Altitude – 2,000' AGL Minimum
 Pre-maneuver Check – Complete
 Airspeed – 100 KIAS
 Pick visual points for 45-135 in each direction
 4. 45° Point – Pitch (~15-20°) Up, 15° Bank (Increasing Pitch, Bank)
 5. 90° Point – Level Pitch, (~30°) Bank (Decreasing Pitch, Increasing Bank)
 6. 135° Point – Pitch Down, 15° Bank (Increasing Pitch, Decreasing Bank)
 7. 180° Point – Straight and Level Percent in Opnosite Direction

Repeat in Opposite Direction





Skills:	The applicant exhibits the skill to:
CA.V.D.S1	Clear the area.
CA.V.D.S2	Select an altitude that allows the maneuver to be performed no lower than 1,500 feet above ground level (AGL).
CA.V.D.S3	Establish the recommended entry configuration, power, and airspeed.
CA.V.D.S4	Maintain coordinated flight throughout the maneuver.
CA.V.D.S5	Complete the maneuver in accordance with the following:
CA.V.D.S5a	a. Approximately 30° bank at the steepest point
CA.V.D.S5b	b. Constant change of pitch and roll rate and airspeed
CA.V.D.S5c	c. Altitude at 180° point, ±100 feet from entry altitude
CA.V.D.S5d	d. Airspeed at the 180° point, ±10 knots from entry airspeed
CA.V.D.S5e	e. Heading at the 180° point, ±10°
CA.V.D.S6	Continue the maneuver through the number of symmetrical loops specified, then resume straight-and- level flight.

Chandelles

Altitude – 2,000' AGL Minimum
 Pre-maneuver Check – Complete
 Airspeed – 100 KIAS
 Bank - 30°
 Throttle – Max Power
 Pitch – Gradually Increase
 90° Point – Max Pitch Up(17-20°)
 Maintain Pitch, Gradually Decrease Bank
 180° Point

 Roll Out : +/- 10° Heading
 Pitch : Maintain without Stalling
 Airspeed : Maintain Just Above Stall

 Slowly decrease pitch to accelerate while holding altitude
 Return to Cruise Flight 100 KIAS

Testing standards:

- Skills:The applicant exhibits the skill to:CA.V.C.S1Clear the area.
- CA.V.C.S2 Select an altitude that allows the maneuver to be performed no lower than 1,500 feet above ground level (AGL).
- CA.V.C.S3 Establish the appropriate entry configuration, power, and airspeed.
- CA.V.C.S4 Establish the angle of bank at approximately 30°.
- *CA.V.C.S5* Simultaneously apply power and pitch to maintain a smooth, coordinated climbing turn, in either direction, to the 90° point, with a constant bank and continuously decreasing airspeed.
- *CA.V.C.S6* Begin a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- *CA.V.C.S7* Complete rollout at the 180° point, ±10° just above a stall airspeed, and maintaining that airspeed momentarily avoiding a stall.

North Star



CA.V.C.S8 Resume a straight-and-level flight with minimum loss of altitude.

Steep Spiral

- Altitude 4,000' AGL Minimum (Altitude enough to complete three turns)
- 2. Pre-maneuver Check Complete

3. Airspeed – 100 KIAS

Select an appropriate heading for entry Prior to being abeam the reference Point

- Throttle Idle
- Pitch Vg

4. Bank up to 60° (Maintain equal Radius)5. Each Upwind Heading – Clear the engine by adding power slowly up to 1700 RPM

After 3rd Turn:

Wings Level

Heading +/- 10°

Recovery:

- Return to Cruise Flight

(No lower than 1500' AGL)

Or

- Climb as Assigned (No lower than 1500' AGL)

Or

- Proceed with Simulate Power – Off Landing (No Lower than 500' AGL)





Skills:	The applicant exhibits the skill to:		
CA.V.B.S1	Clear the area.		
CA.V.B.S2	Select an altitude sufficient to continue through a series of at least three, 360° turns.		
CA.V.B.S3	Establish and maintain a steep spiral, not to exceed 60° angle of bank, to maintain a constant radius about a suitable ground reference point.		
CA.V.B.S4	Apply wind-drift correction to track a constant radius circle around selected reference point with bank not to exceed 60° a steepest point in turn.		
CA.V.B.S5	Divide attention between airplane control, traffic avoidance and the ground track while maintaining coordinated flight.		
CA.V.B.S6	Maintain the specified airspeed, ±10 knots and roll out toward an object or specified heading, ±1		
	and complete the maneuver no lower than 1,500 feet above ground level (AGL).		



COMMERCIAL PILOT MANEUVERS END



Flight Instructor Maneuvers

Cross Control Stall

- 1. Altitude 3,000' AGL Minimum Recover Altitude
- 2. Pre-maneuver Check Complete
- 3. Set Flaps (0°)
- 4. Reduce power to idle and maintain altitude
- 5. Establish pitch for 76kts
- 6. Once glide is established, roll into a turn with medium bank to simulate the overshooting runway centerline (~20°-30° of bank)
- 7. During the turn an excessive amount of rudder shall be applied in the direction of the turn
- 8. Bank should be held by applying opposite aileron
- 9. At the same time begin to apply yoke backpressure to prevent the nose from lowering
- 10. All control inputs should be increased until the aircraft reaches an impending stall

(Buffet or Stall warning horn)

Skidding Turn Up aileron creates lower angle-of-attack Ailerons counter overbanking tendency **Too much rudder** causes skid **Down aileron creates** higher angle-of-attack boldmethod)

Recovery:

- 1. Begin a prompt recovery at impending Stall. (Buffet or Stall warning horn)
- 2. Reduce angle of attack by releasing yoke backpressure, at the same time neutralize the ailerons and rudder.
- 3. Smoothly advance the throttle to full power.
- 4. Level the wings.
- 5. Resume coordinated normal cruise flight

Skills:	The applicant exhibits the skill to:
AI.X.F.S1	Clear the area.
AI.X.F.S2	Select an entry altitude that allows the Task to be completed no lower than 3,000 feet above ground level (AGL).
AI.X.F.S3	Configure the airplane (with gear down) and close the throttle.
AI.X.F.S4	Establish a normal glide airspeed and trim the airplane.
AI.X.F.S5	Roll into a medium-banked turn, apply excess rudder in the turn while holding bank constant with opposite aileron input, and add elevator pressure to keep the nose from lowering.
AI.X.F.S6	Acknowledge the cues at the first indication of a stall (e.g., aircraft buffet, stall horn, etc.).
AI.X.F.S7	Recover at the first indication of a stall or after a full stall has occurred, as specified by the evaluator.
AI.X.F.S8	Describe and demonstrate conditions that lead to a cross-controlled stall for future avoidance.
AI.X.F.S9	Analyze and correct common errors related to this Task.



Elevator Trim Stall

North Star

- 1. Altitude 3,000' AGL Minimum Recover Altitude
- 2. Pre-maneuver Check Complete
- 3. Smoothly bring throttle back to idle
- 4. With power reduced pitch to maintain altitude wait for 64kts, and trim the aircraft to maintain speed
- 5. Pitch the aircraft down and increase flaps to full (40°)
- 6. Smoothly increase power to full and pitch up to an attitude that will induce an impending stall

Recovery:

- 1. Recognize the impending stall, promptly begin the recovery
 - (Buffet or Stall warning horn)
- 2. Reduce angle of attack, apply forward pressure as needed
- 3. Re-trim the aircraft to reduce back pressure
- 4. Positive Rate flaps to 25° and establish climb at 64kts
- 5. Retract flaps to 0° and establish climb at 76kts
- 6. Resume coordinated normal cruise flight



- AI.X.G.S1 Clear the area.
- *AI.X.G.S2* Select an entry altitude that allows the Task to be completed no lower than 3,000 feet above ground level (AGL).
- AI.X.G.S3 Retard the throttle and configure the airplane for landing.
- Al.X.G.S4 Establish a normal glide airspeed and trim the airplane.
- Al.X.G.S5 Advance the throttle to the maximum allowable power as in a go-around.
- AI.X.G.S6 Acknowledge the cues at the first indication of a stall (e.g., aircraft buffet, stall horn, etc.).
- AI.X.G.S7 Recover at the first indication of a stall or after a full stall has occurred, as specified by the evaluator.
- Al.X.G.S8 Adjust trim and return to the desired flightpath.
- AI.X.G.S9 Describe and demonstrate conditions that lead to an elevator trim stall for future avoidance.
- AI.X.G.S10 Analyze and correct common errors related to this Task.

Secondary Stall

- 1. Altitude 3,000' AGL Minimum Recover Altitude
- 2. Pre-maneuver Check Complete
- 3. Execute power-on or power-off stall

(as specified by your instructor)

- 4. Begin an improper recovery, while attempting to minimize altitude loss
- 5. Maintain an improper pitch attitude, continuing to apply back pressure
- 6. Smoothly apply full power

(if previously a power-off stall was specified)

7. This should result in a secondary stall

Recovery:

- 1. Recognize the impending secondary stall (Buffet or Stall warning horn)
- 2. Reduce angle of attack, release back pressure
- 3. Smoothly apply full throttle
- 4. Maintain coordination
- 5. Positive Rate flaps to 25° and establish climb at 64kts
- 6. Retract flaps to 0° and establish climb at 76kts
- 7. Resume coordinated normal cruise flight

Testing standards:

Initial stal

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Skills:	The applicant exhibits the skill to:
AI.X.H.S1	Clear the area.
AI.X.H.S2	Select an entry altitude that allows the Task to be completed no lower than 3,000 feet above ground level (AGL).
AI.X.H.S3	Enter a stall in a specified configuration and exceed the critical angle of attach a second time during the recovery.
AI.X.H.S4	Recover promptly and appropriately after a secondary stall occurs.
AI.X.H.S5	Describe and demonstrate conditions that lead to a secondary stall for future avoidance.
AI.X.H.S6	Analyze and correct common errors related to this Task.

Secondary Stall

Incomplete or

improper recovery

This is for training purposes only!

Secondary stalls may occur in various configurations and scenarios. This is not a completed list of how or when they may occur. This scenario is only meant for a singular example of how this maneuver may be conducted. For more examples, please reach out to your instructor.



Secondary stall

Demonstration of Flight Characteristics at Various Configurations and Airspeeds



- 1. Altitude 1,500' AGL Minimum Recover Altitude
- 2. Pre-maneuver Check Complete
- 3. Enter and recover in a specified configuration as listed in following slides

Demonstration of Flight Characteristics at Various Configurations and Airspeeds

Landing configuration domonstration

ALV P CE



AI.A.D.33	Landing configuration demonstration.
AI.X.B.S5a	 a. Establish and maintain design/operating maneuvering speed appropriate to the airplane's weight while describing pitch, power, and trim inputs to maintain altitude and airspeed, then;
AI.X.B.S5b	 Slow the airplane to, and maintain, the appropriate limiting airspeeds and fully extend the landing gear and flaps (as appropriate), then;
AI.X.B.S5c	 With gear and flaps fully extended (as applicable), slow the airplane to, and maintain, reference landing speed (or as specified by the evaluator), noting the power setting required,
AI.X.B.S5d	 With gear and flaps fully extended, continue to slow the airplane to, and maintain, an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power — Approximately 45 Knots would result in an immediate stall, and maintain that airspeed in level flight, noting the airspeed and power setting required, while;
AI.X.B.S5e	e. Verbally acknowledging stall warning indications, then;
AI.X.B.S5f	 f. Without changing power setting, lower the pitch attitude and accelerate to a faster airspeed until reestablishing the airplane in in level flight, noting the new airspeed and amount of altitude lost, then;
AI.X.B.S5g	g. Return to normal cruise flight at the altitude and heading specified by the evaluator

Demonstration of Flight Characteristics at Various Configurations and Airspeeds

Clean configuration demonstration:

AI.X.B.S4



AI.X.B.S4a	 Establish and maintain design/operating maneuvering speed appropriate to the airplane's weight while describing pitch, power, and trim inputs to maintain altitude and airspeed, then; 	>	100 Knots
AI.X.B.S4b	b. With gear and flaps retracted (as applicable), slow the airplane to, and maintain, best glide speed (or as specified by evaluator), noting the power setting required, then;	>	76 Knots
AI.X.B.S4c	c. Continue to slow the airplane to, and maintain, an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power would result in an immediate stall, and maintain that airspeed in level flight, noting the airspeed and power setting require while;	d,►	Approximately 50 Knots
AI.X.B.S4d	d. Verbally acknowledging stall warning indications, then;		
AI.X.B.S4e	 Without changing power setting, lower the pitch attitude and accelerate to a faster airspeed until reestablishing the airplane in level flight, noting the new airspeed and amount of altitude lost, then; 	●	100 Knots
AI.X.B.S4f	f. Return to normal cruise flight at the altitude and heading specified by the evaluator		