Maneuver Guide

Seminole (PA-44-180)

Multi Engine Training Considerations

- Simulated engine failures before takeoff will be accomplished prior to reaching 50% of Vmc. (28 KIAS)
- Only throttles should be used to simulate engine failures below 3,000ft AGL.
- Simulated engines failures will not be initiated below 400 AGL.
- Factors affecting Vmc and how Vmc differs from stall speed will be thoroughly briefed before every Vmc demonstration.
- Complete engine shutdowns are only authorized above 3,000ft AGL.
- Complete engine shutdowns are not authorized unless, after considering factors affecting single engine performance should the feathered engine not restart, the aircraft can return safely to the nearest airport.

PA-44 V-Speeds

V-Speed	KIAS	Description	A/S Marking
Vso	55	Stall speed, landing configuration	Bottom of White Arc
Vs	57	Stall speed, specified configuration	Bottom of Green Arc
Vmc	56	Min controllable airspeed, Single Engine	Red Line
Vr	75	Rotation Speed	
Vx	82	Best angle of climb	
Vxse	88	Best angle of climb, single engine	
Vsse	82	Safe speed for engine intentional failures	
Vy	88	Best rate of climb	
Vyse	88	Best rate of climb, single engine	Blue Line
Vfe	111	Flap extension speed	Top of White Arc
Vlo (Up)	109	Max gear retraction speed	
Vlo (Down)	140	Max gear extension	
Vle	140	Max speed with gear extension	
Vno	169	Max structural cruising speed, smooth air	Top of Green Arc
Vne	202	Never exceed speed	Red Line
Vo (Va)	135	Maneuvering speed at max gross wt.	

PA-44 Weight and Fuel Limitations

Max Ramp Weight	3,816 lbs
Max Takeoff Weight	3,800 lbs
Max Landing Weight	3,800 lbs
Max Baggage	200 lbs
Total Fuel	110 gallons
Usable Fuel	108 gallons

Departure Procedures

Pre-Takeoff Briefing

1.0 *Brief of Normal Takeoff*

- Flaps 0
- Rotation 75 KIAS
- Climb Speed 88 KIAS

2.0 *Brief of Emergency Procedures*

- **Engine failure or other anomalies prior to takeoff:**

  **** Simulated engine failures before takeoff will be accomplished prior to reaching 50% of Vmc. (28 KIAS)**

  - Abort takeoff- Power to idle
  - Brake as required and exit the runway
    - If not enough runway to stop
      - Mixture idle cutoff
      - Fuel selectors, mags, and master off.

- **Engine failure after rotation:**

  **** Only throttles should be used to simulate engine failures below 3,000ft AGL.**
  ***** Simulated engines failures will not be initiated below 400 AGL.**

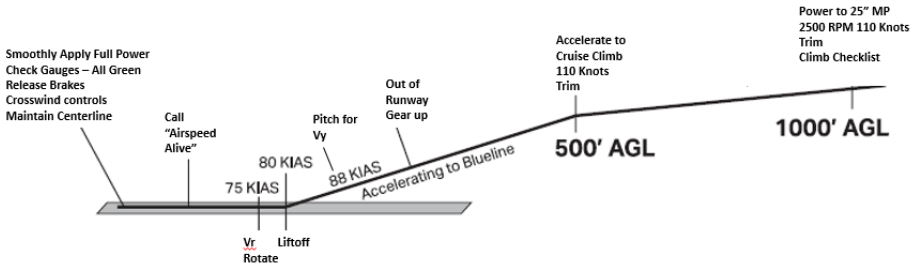
  - **Gear down and sufficient runway for a complete stop.**
    - Maintain directional control
    - Throttles closed
    - Land straight ahead and brake as required.

  - **Gear up and no usable runway**
    - Airspeed (Vyse) and directional control
    - Mixtures, props, and throttles forward
    - Verify gear and flaps up
    - Identify and verify dead engine (Dead foot/Dead engine)
    - Feather Prop and establish Zero Sideslip
    - Assess and determine if available performance is suitable for return to airport.

Normal Takeoff

1) Pre-Takeoff Briefing Complete
2) Flaps 0
3) Line up on runway centerline.
4) Heels on floor and apply full power.
5) Verify power stable and airspeed alive.
6) Vr-75
7) Accelerate and climb at 88 KIAS to 500' AGL
8) Positive rate of climb and no runway remaining---tap brakes & gear up
    a. Gear up below 109 KIAS. (VLo)
9) Establish cruise climb after 500’ AGL. 110 KIAS.
    a. 25”MP and 2,500 RPM after 500 AGL
10) “After takeoff checklist”

PA44 Seminole Normal Takeoff and Climb Profile



Maximum Performance Takeoff

1) Pre-Takeoff Briefing Complete
2) Flaps 0
3) Hold brakes at departure end of runway. (Use most available runway)
4) Increase throttles to 2000 RPM to check engine gauges.
5) Increase throttles to full power and release brakes.
6) Verify power stable and airspeed alive.
7) Rotate at 70 KIAS or as specified in the POH (5-17) as determined by takeoff weight.
8) Climb at 82 KIAS until obstacle cleared.
9) Gear up after positive rate of climb.
    a. Gear up before 109 KIAS (VLo)
10) Establish cruise climb after 500’ AGL. 110 KIAS.
    a. 25”MP and 2,500 RPM after 500 AGL
11) “After takeoff checklist”

Normal Landing

1) Join downwind at 18" and 2300rpm Approx. 100kts
2) Prelanding check, GUMP
    a. Fuel selectors and Pumps on
    b. Undercarriage down below 140 KIAS
    c. Mixture rich
    d. Props
3) Abeam touchdown point, flaps to 10 and start 200-300fpm descent
4) Turn base and slow to Blue Line (88kts) increasing flaps to 25
    a. GUMPs
5) Turn final and maintain Blueline (88kts) until landing is assured.
6) Verify approach stabilized below 500 AGL
7) When runway is assured increase flaps to full and slow to 80 KIAS.
8) Short final, verify gear down and props forward.

Short Field Landing

1) Join downwind at 18" and 2300rpm Approx. 100kts
2) Prelanding check, GUMP
    a. Fuel selectors and Pumps on
    b. Undercarriage down below 140 KIAS
    c. Mixture rich
    d. Props
3) Abeam touchdown point, flaps to 10 and start 200-300fpm descent
4) Turn base and slow to Blue Line (88kts) increasing flaps to 25
    a. GUMPs
5) Turn final and maintain Blueline (88kts) until landing is assured.
6) Verify approach is stabilized below 500 AGL
    a. A steeper than normal approach may be needed to clear the obstacle.
7) When runway is assured increase flaps to full, slow to 75 KIAS.
8) Short final, verify gear down and props forward.
9) Landing with minimal floating.
10) Simulate maximum braking.

Go-Around (Both Engines)

**** Single-engine go-arounds will not be attempted in the PA-44.**

1)	Mixtures	Full Rich
2)	Props	Full Increase
3)	Throttles	Full Open
4)	Pitch for Vx	82 KIAS
5)	Flaps	Retract Incrementally
6)	Gear	Up (Retract gear below 109 (VLo)

Emergency Decent

1)	Throttles	Closed
2)	Props	Full Increase
3)	Mixtures	As Required
4)	Cowl Flaps	Closed
5)	Gear	Down below 140 KIAS
6)	Airspeed	120 KIAS (For training)
7)	Bank	30 degrees to maintain positive load during the descent

Power Off Stalls

1) Clearing turns
2) Power-15" to 16" manifold pressure
3) Flaps-10 below 111 KIAS
4) Gas-verify fuel pumps on & fuel on mains
5) Undercarriage-down below 140 KIAS (verify down & locked)
6) Mixtures-enrichen for recovery
7) Flaps-full down below 111 KIAS
8) Propellers - forward below 100 KIAS
9) Pitch to attain imminent stall

--recovery--

10) Release elevator back pressure to decrease AOA.
11) Full power
12) Flaps-10 degrees
13) Pitch to vx-82 KIAS if obstacle exists or blue line 88 KIAS if no obstacle
14) Verify positive rate of climb
15) Gear up
16) Remaining flaps-up

Power On Stalls

1) Clearing turns
2) Power-15" to 16" M.P.
3) Flaps-remain up
4) Gas-pumps on & mains
5) Undercarriage-remains up
6) Mixtures-enrichen
7) Increase pitch to dissipate airspeed to vr-75 KIAS
8) Propellers-forward below 100 KIAS
9) Increase M.P. To 20" and increase pitch to attain a stall

--recovery--

10) Release elevator back pressure to decrease AOA.
11) Pitch to vx-82 if obstacles exist, Vyse-88 if no obstacles

Slow Flight

1) Clearing turns
2) Power-15" to 16" M.P.
3) Flaps-10 below 111 KIAS
4) Gas-pumps on & mains
5) Undercarriage-down below 140 KIAS
6) Mixtures-enrichen for recovery
7) Flaps-full down below 111 KIAS
8) Props-forward below 100 KIAS
9) As airspeed approaches Vmc, add appx. 17" to 18" M.P. to Maintain Vmc -0 +2 KIAS. Maintain altitude +or-50' and heading within 5 degrees of a section line.

--recovery--

10) Apply full power
11) Flaps-25 degrees
12) Gear-up
13) Flaps- Retract incrementally.
14) Pitch must be decreased to maintain altitude as airspeed increases. Resume normal cruise.

Steep Turns

1) Clearing turns
2) Pre-maneuver check list
3) Set power for 120KIAS
4) Roll into a coordinated 360 degree turn with approximately 50 degrees of bank.
5) Repeat in opposite direction.

Vmc demonstration

**** This task must be completed no lower than 3,000 AGL**
**** Factors affecting Vmc and how Vmc differs from stall speed will be briefed before every Vmc demonstration.**
**** In all cases, recover will be initiated at the first sign of an impeding stall.**

1) Clearing turns
2) Power-15" to 16" M.P.
3) Flaps-remain up
4) Gas-pumps on & mains
5) Undercarriage-remains up
6) Mixtures-enrichen as needed

7) Prop controls-slowly full forward
8) Left engine power-idle (windmill)
9) Right engine power-full power
10) Establish Zero Sideslip.
11) Increase pitch to dissipate airspeed while maintaining directional control with rudder. At the first indication of loss of directional control or stall indication, decrease pitch to regain directional control and reduce power on right engine.
12) Once directional control is regained, increase power to full on operating engine to accelerate to and maintain Vyse-88
13) Enrichen mixture on left engine and resume normal cruise if left engine CHT is normal, if not-allow engine to warm with 10"-11"M.P. With leaned mixture before increasing to cruise power.

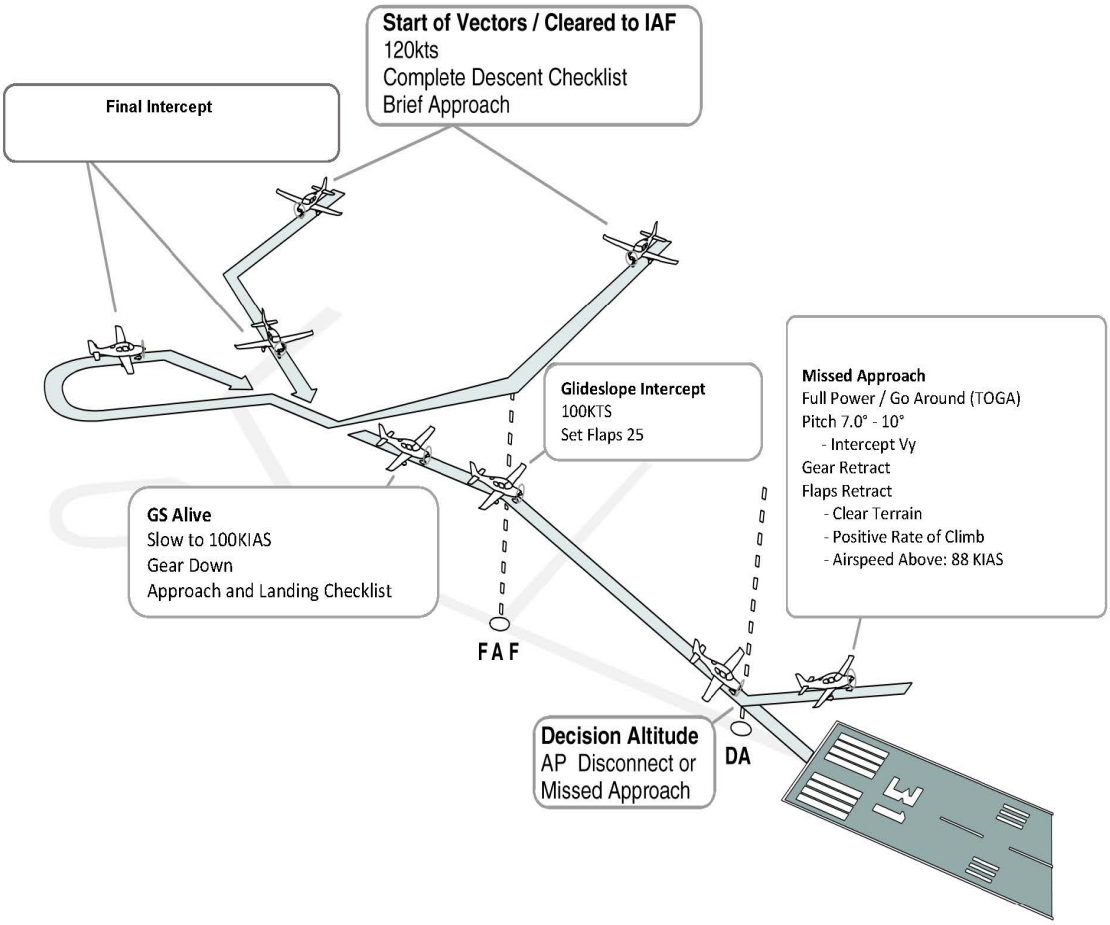
Drag demonstration

1) Clearing turns
2) Power-15" to 16" M.P.
3) Gas-low & mains
4) Undercarriage-remains up
5) Mixtures-enrichen right, lean left to retain heat
6) Prop controls-slowly full forward
7) Left engine-idle (windmill), allow airspeed to dissipate.
8) As airspeed approaches Vyse, increase power to zero thrust (simulated feather) on left engine. Increase power on right engine to maintain level flight at Vyse
9) Flaps-lower to 10 while decreasing pitch to maintain Vyse and note descent rate (appx. 200-250 fpm)
10) Landing gear-extend while decreasing pitch to maintain Vyse and note descent rate (appx. 200-300 fpm)
11) Flaps-lower to 45 while decreasing pitch to maintain Vyse and note descent rate (appx. 400-500 fpm)
12) Left engine power-decrease from zero thrust (simulated feather) to windmill (idle) while increasing right rudder to maintain heading and decreasing pitch to maintain Vyse and note descent rate (appx. 500 to 600 fpm)

--recovery--

13) Retract flaps to 10, maintain Vyse
14) Retract landing gear, maintain Vyse
15) Retract flaps to 0, maintain Vyse
16) Increase left engine M.P. To 12" to warm CHT into green arc.
17) Resume normal cruise

Precision Approach One or Two Engines



Non-Precision Approach One or Two Engines