

NORMAL TAKE OFF

1. Line up on centerline position controls for wind.
2. Hold brakes - Increase throttles to 1500 RPM.
3. Check engine gauges.
4. Release brakes.
5. Increase throttles to full power.
6. *"Airspeed Alive."*
7. Start rotation at 84 MPH.
8. Accelerate to 100 MPH/Blueline (V_y).
9. Establish a positive rate of climb and retract the gear if no runway remains.
(When taking off from runways 3,000' or less, no runway usually remains after a positive rate of climb has been established.)
10. Climb at 100 MPH/Blueline (V_y) until 500' AGL.
11. Climb at 120 MPH after passing through 500' AGL.
(120 MPH provides better visibility and engine cooling. Density altitude, terrain, obstacles, etc. may require a climb speed from 90-100 MPH.)
12. Reduce throttles to 25" MP and props to 2500 RPM
13. *"After Takeoff Checklist"* out of 1,000' AGL.

NORMAL APPROACH & LANDING

1. Slow to approx. 17" MP – and less than 120 MPH to enter traffic pattern.
2. Downwind: Call & Complete: *"Gear Down - Before Landing Checklist."*
3. *"BCGUMP."* *"Boost Pumps, Carb Heat, Gas, Undercarriage (verify), Mixtures, Props."*
4. Abeam approach end, or at 3 miles extended final (When ready to descend out of pattern alt.):
5. Extend flaps 10°.
6. Descend out of TPA at 100 MPH/Blueline.
7. Flaps 20° prior to Base Turn or 2-mile straight in Final
8. Full Flaps 33° prior to Final Turn or prior to 1-mile straight in Final
9. Maintain 100 MPH/Blueline slowing to 90 MPH on Short Final.
10. Stabilized at 500' AGL Announce: *"Green Light, One in the Mirror, Stabilized"*
11. Reduce power to idle over touch-down point.

SHORT-FIELD TAKE OFF

1. Flaps 10°
2. Use all available runway
3. Hold brakes – Increase throttles to full power.
4. Check engine gauges.
5. Release brakes.
6. *"Airspeed Alive."*
7. Rotate at 84 MPH
8. Climb at 95 MPH
9. Establish a positive rate of climb and retract the gear immediately.
10. After 50ft. obstacle, Climb at 100 MPH/Blueline (V_y).
11. Climb at 120 MPH after passing through 500' AGL.
12. Reduce throttles to 25" MP and props to 2500 RPM
13. *"After Takeoff Checklist"* out of 1,000' AGL.

SHORT-FIELD APPROACH & LANDING

1. Slow to approx. 17" MP – and less than 120 MPH to enter traffic pattern.
2. Downwind: Call & Complete: *"Gear Down - Before Landing Checklist."*
3. *"BCGUMP."* *"Boost Pumps, Carb Heat, Gas, Undercarriage (verify), Mixtures, Props."*
4. Abeam approach end, or at 3 miles extended final (When ready to descend out of pattern alt.):
5. Extend flaps 10°.
6. Descend out of TPA at 100 MPH/Blueline.
7. Flaps 20° prior to Base Turn or 2-mile straight in Final
8. Full Flaps 33° prior to Final Turn or prior to 1-mile straight in Final
9. Maintain 100 MPH/Blueline slowing to 90 MPH on Final, 84 MPH on Short Final.
10. Stabilized at 500' AGL Announce: *"Green Light, One in the Mirror, Stabilized"*
11. Close throttles prior to touch down point with little or no floating.
12. Maintain back pressure on control wheel to avoid slamming the nose on the runway
*NOTE: *Do NOT retract flaps after landing. The squat switch is inactive until the full amount of weight is on wheels, which can occur late after touch-down (usually below 10-20 kts.)*
ADDITIONALLY – the Travel Air POH does NOT mention Flap retraction upon touchdown during a short field landing
13. Simulate and announce "max braking" for training and checkride purposes.

GO-AROUND

1. Increase throttles to full power and pitch for climb (*NO SLOWER THAN ROTATION SPEED*).
2. Retract flaps slowly to 10°. (*Slowly to preclude excessive sink.*)
3. Positive Rate, Landing Gear Up
4. Climb at 100 MPH/Blueline (V_y) until 500' AGL.
5. Climb at 120 MPH after passing through 500' AGL.
6. Reduce throttles to 25" MP and props to 2500 RPM
7. *"After Takeoff Checklist"* out of 1,000' AGL.

SINGLE-ENGINE APPROACH & LANDING

1. Perform Engine Fail Checklist below 3,000' AGL - *****MUST HAVE MEMORIZED*****

MUST MEMORIZE IN ITS ENTIRETY

ENGINE FAILURE IN FLIGHT *BELOW 3,000 AGL*

Mixtures Full Forward
Props Full Forward
Throttles Full Forward

Maintain Directional Control/Pitch Attitude/Airspeed (100)

Flaps Up
Gear Up
Boost Pumps On
Identify Dead Foot
Verify/Throttle Closed
INOP ENG Prop *Verify/Feather (SIMULATED FOR TRAINING)
INOP ENG Mixture *Verify/Cutoff (SIMULATED FOR TRAINING)
Climb 100 (Blue Line)

Declare an Emergency / Land at Nearest Suitable Airport

2. Downwind: *"BCGMP."* *"Boost Pumps, Carb Heat, Gas, Mixtures, Props."*
3. When time permits – Declare an emergency with ATC **(not while performing checklists)*
4. LANDING GEAR down only once ready to GO DOWN (to descend out of current altitude).
5. Do NOT extend flaps for single-engine approach and landings.
6. Descend at 100 MPH/Blueline
NOTE: (it can be an automatic failure if you get slower than blue line on a single engine approach/landing)
7. Stabilized at 500' AGL Announce: *"Green Light, One in the Mirror, Stabilized"*
8. Maintain 100 MPH/Blueline until ready to touch-down.
9. Slowly reduce power to idle over touch-down point.

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MANEUVER CHECKLIST

All maneuvers will be performed with the Three C's before and Three C's After

| BEFORE | MANEUVER CONFIGURATION | | AFTER |
|---------------|---|--|---------------|
| C – CLEAR | <u>CLEAN</u> | <u>DIRTY</u> | C – CLEAN |
| C – CALL | Gear-up, Flaps-up, | Gear-down, Flaps-down. | C – CRUISE |
| C - CONFIGURE | Mixtures–Enrichen, Props– FWD, Boost Pumps–On. | Mixtures–Enrichen, Props– FWD, Boost Pumps–On | C - CHECKLIST |

STEEP TURNS - *CRUISE CONFIGURATION*

Steep turns are to be accomplished above 3,000' AGL. Roll into a coordinated 360° steep turn with approximately 45° of bank. (approx. 50° for Commercial Pilot)

1. Clearing turns.
2. Set power to maintain 140 MPH throughout maneuver.
(18" to start, increases to 20" PPL or 21" COM once bank is established)
3. Establish entry heading.
4. Maintain 140 MPH or a safe airspeed not to exceed V_A .
5. Adjust power as approx. to 20-21" during maneuver.
6. Perform 360° turn to the left maintaining approximately 45° (Comm: 50°) bank $\pm 5^\circ$.
7. Roll out on entry heading $\pm 10^\circ$.
8. Perform 360° turn to the right maintaining approximately 45° (Comm: 50°) bank $\pm 5^\circ$.
9. Roll out on entry heading $\pm 10^\circ$.

| | PRACTICAL TEST | Airspeed | Altitude | Bank | Heading |
|--|----------------|--------------|------------|---------------|----------------|
| | | ± 10 MPH | $\pm 100'$ | $\pm 5^\circ$ | $\pm 10^\circ$ |

SLOW FLIGHT - *DIRTY CONFIGURATION*

Slow flight is to be accomplished above 3,000' AGL. Maneuver is accomplished in landing configuration while demonstrating coordinated straight-and-level flight, climbs, turns, and descents. The airspeed selected is that at which any further increase in angle of attack, increase in load factor, or reduction in power would result in an immediate stall.

1. Reduce Throttles to 15" MP
2. Clearing turns.
3. *"Gear Down - Before Landing Checklist."* Perform *"BCGUMPS"*
4. Extend full flaps 33°.
5. Slow to just above stall (approximately 80 MPH).
6. Adjust power as necessary to maintain airspeed while maneuvering.
7. Accomplish straight-and-level flight, climbs, turns, and descents as required.
8. Recover with max power.
9. Retract flaps slowly to 10°.
10. Accelerate to 84 MPH (V_x), maintain altitude.
11. Retract gear, accelerate to 100 MPH (V_Y).
12. Reaching starting altitude - *"Cruise Checklist."*

| | PRACTICAL TEST | Airspeed | Altitude | Bank | Heading |
|--|----------------|-----------|-----------|---------------|----------------|
| | | +5/-0 MPH | $\pm 50'$ | $\pm 5^\circ$ | $\pm 10^\circ$ |

POWER OFF STALLS - *DIRTY CONFIGURATION*

Stalls are accomplished above 3,000' AGL, with a stabilized descent approx. 400 FPM. Commercial requires recovery at the first indication of a stall (usually red light). This may be accomplished on a selected heading $\pm 10^\circ$ or in a 15° bank turn (max bank 20°).

1. Reduce Throttles to 15" MP
2. Clearing turns.
3. *"Gear Down - Before Landing Checklist."* Perform *"BCGUMPS"*
4. Extend full flaps 33°.
5. Capture 90 MPH and establish a stabilized 400 FPM descent at 90 MPH.
6. Maintain selected heading or establish 15° bank turn as specified by Examiner.
7. Power to idle while increasing pitch attitude to induce stall.
8. Recover at the first indication of a stall condition. (or full stall for private)
9. Reduce angle-of-attack, set max power, and level wings.
10. Retract flaps slowly to 10°.
11. Accelerate to 84 MPH (V_x), establish a positive rate of climb.
12. Retract gear, accelerate to 100 MPH (V_Y).
13. Retract flaps to 0°.
14. Reaching starting altitude - *"Cruise Checklist."*

| | PRACTICAL TEST | Bank | Heading |
|--|----------------|---------------|----------------|
| | | $\pm 5^\circ$ | $\pm 10^\circ$ |

POWER ON STALLS - *CLEAN CONFIGURATION*

Stalls are to be accomplished above 3,000' AGL. Commercial requires recovery at the first indication of a stall condition (usually red light). This may be accomplished in the takeoff configuration (Gear Down, Flaps 10°) or the departure configuration (Gear Up, Flaps 0°) while on a selected heading $\pm 10^\circ$ or in a 15°-bank turn (Max bank 20°) $\pm 10^\circ$.

1. Reduce Throttles to 15" MP
2. Clearing turns.
3. Set takeoff or departure configuration as specified by the Examiner:
 - A. Takeoff configuration (Gear Down, Flaps 10°).
 - B. Departure configuration (Gear Up, Flaps 0°).
4. Mixtures – Enrichen, Props – FWD, Boost Pumps–On.
5. Slow to 84 MPH, liftoff speed.
6. Maintain selected heading or establish a 15°-bank turn, as specified by the Examiner.
7. Pitch-up to induce stall, while leaving power at 15" MP.
8. Recover at the first indication of a stall condition. (or full stall for private)
9. Reduce angle-of-attack, set max power, and level wings.
10. Accelerate to 84 MPH (V_x), establish a positive rate of climb.
11. Retract gear (if extended), accelerate to 100 MPH (V_Y). *"BLUE LINE, CAPTURE, CLIMB"*
12. Reaching starting altitude - *"Cruise Checklist."*

| | PRACTICAL TEST | Bank | Heading |
|--|----------------|---------------|----------------|
| | | $\pm 5^\circ$ | $\pm 10^\circ$ |

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ACCELERATED STALLS ***COMMERCIAL ONLY*** - *CLEAN CONFIGURATION*

Accelerated stalls are accomplished at an altitude that allows the maneuver to be completed no lower than 3,000 feet AGL. Transition smoothly from cruise attitude to a bank angle of 45°, maintaining coordinated turning flight, while increasing elevator back pressure steadily to induce the stall.

1. Reduce Throttles to 15" MP
2. Clearing Turns
3. Gear-up, Flaps-up.
4. Mixtures–Enrichen, Props–FWD, Boost Pumps–On.
5. Slow to 100 MPH (Blue Line)
6. Reduce power to idle.
7. Establish a coordinated 45° bank turn.
8. Maintain altitude to induce stall.
9. Recover promptly at the first indication of a stall condition.
10. Reduce angle-of-attack, set max power, and level wings.
11. Accelerate to 100 MPH (V_Y). "*BLUE LINE, CAPTURE, CLIMB*"
12. Reaching starting altitude - "*Cruise Checklist.*"

VMC DEMO - *CLEAN CONFIGURATION*

V_{MC} Demo is to be accomplished at or above 3,000' AGL. Increase the pitch attitude slowly to reduce the airspeed at approximately 1 knot per second while applying rudder pressure to maintain directional control until full rudder is applied. As the speed decreases, additional aileron input will be required to maintain a maximum of 5° bank toward the operating engine. Recover at the first indication of loss of directional control (heading within 5°), stall light, or buffet.

1. Reduce Throttles to 15" MP
2. Clearing turns.
3. Gear-up, Flaps-up.
4. Mixtures–Enrichen, Props–FWD, Power-FWD, Boost Pumps–On.
5. Slowly close left throttle while maintaining heading and altitude.
6. Slow to 110 MPH (approx. 10 MPH above V_{YSE}).
7. Slowly increase right throttle (operating engine) to full power. Use rudder to maintain directional control and bank up to 5° towards the operating engine.
8. Increase pitch attitude slowly, decrease airspeed at approximately 1 knot per second until full rudder is applied to maintain directional control.
9. Recover at first sign of:
 - A. Loss of directional control.
 - B. First indication of stall (stall light or buffet).
10. Recover promptly by reducing power to idle on the operating engine while decreasing the angle of attack as necessary to regain directional control within 20° of entry heading.
11. Increasing power slowly on operating engine while maintaining blue line
12. Accelerate to 100 MPH/Blue line (V_Y). "*BLUE LINE, CAPTURE, CLIMB*"
13. Once recovered and maintaining blue line. Bring throttles slowly together to 18" MP.
14. Reaching starting altitude - "*Cruise Checklist.*"

***NOTE: Recovery shall not be attempted by increasing the power on the simulated failed engine for demonstration**

EMERGENCY DESCENT

*NOTE: When performing and recovering from the Emergency Descent, verify airspeed remains below 150 KIAS (maximum gear speed).

EMERGENCY DESCENT

| | |
|------------------------------|-----------------|
| Throttles | Idle/Closed |
| Prop (Operating Engine)..... | Full Forward |
| Mixtures | Adjust |
| Gear | Below 150, Down |
| Maintain | 150 MPH |
| Bank | 30-45° |

Notify ATC as soon as practical

***Upon recovery remember to retract gear first then perform the cruise checklist.

ENGINE FAILURE ABOVE 3,000 AGL PROCEDURE

1. Instructor or examiner simulates engine failure with the mixture/fuel selector.
2. Complete the In-Flight Engine Failure Checklist.
3. Complete the Troubleshoot Checklist above 3,000' AGL (if no obvious damage).
4. If no re-start, continue the In-Flight Engine Failure Checklist and complete the Engine Failure Secure Checklist.
5. Maneuver as specified by instructor or examiner.

*NOTE: When performing the engine shutdown and secure maneuver as part of a training event (as opposed to an actual emergency), the items on the Engine Failure Secure Checklist are to be **simulated** (touched but **not** actuated).

ENGINE FAILURE IN FLIGHT *ABOVE 3,000 AGL*

| | |
|---|-----------------|
| Mixtures | Full Forward |
| Props | Full Forward |
| Throttles | Full Forward |
| Maintain Directional Control/Pitch Attitude/Airspeed (100) | |
| Flaps | Up |
| Gear | Up |
| Boost Pumps | On |
| Identify | Dead Foot |
| Verify/Throttle | Closed |
| Climb | 100 (Blue Line) |

TROUBLESHOOT *ABOVE 3,000 AGL*

| | |
|--------------------------|--------------|
| Magnetos On | |
| Boost Pumps | On |
| Fuel Quantity | Check/Change |
| Fuel Selectors | Change Tanks |
| Carb Heat On, Check, Off | |
| Engine Instruments | Check |

IF UNABLE TO RESTART

| | |
|---|-----------------|
| INOP ENG Prop | *Verify/Feather |
| INOP ENG Mixture | *Verify/Cutoff |
| Declare an Emergency with ATC / Land at Nearest Suitable Airport | |
| Engine Securing Checklist | Perform |

ENGINE SECURING CHECKLIST

| | |
|------------------------------|---------|
| INOP ENG Fuel Selector | Off |
| INOP ENG Boost Pump | Off |
| INOP ENG Magnetos | Off |
| INOP ENG Alternator | Off |
| INOP ENG Cowl Flap | Closed |
| Cruise Checklist | Perform |

*AFTERWARDS upon examiner stating the maneuver is complete: Perform the air-start procedure (which is a separate maneuver) using the Air-start Checklist.

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For The MEI Checkride: How to Simulate Engine Failures in Flight

While this section is designed for instructors, it is important for all students to understand the engine failure circumstances for training and checkride purposes.

*As an instructor, you **MUST** know when and how to simulate engine failures for your students during different phases of flight.*

There are 4 phases in which you will be required to simulate engine failures and it is critical for you as an instructor to know how to execute the simulation and how to protect and guard against a simulated engine failure becoming an actual emergency.

There are only two ways an instructor should fail the engine. These methods are either with the throttle or with the mixture.

Additionally, all engine failure maneuvers will lead the student to feather the propeller, however, under some circumstances this will only be simulated.

***A quick reference to which method should be used to fail the engine and if the prop should be actually feathered, would be if the aircraft is performing an approach to landing and may need to perform a go-around in the event the student improperly performs the maneuvers or created an unstable approach. For an approach to landing, the engine should be failed Only with the **throttle** and the prop should Only be **simulated** feathered, which allows for a timely go-around only requiring both throttles to be pushed forward in the event it is needed to go-around.*

All other situations like the engine failure on the ground or the engine failure in flight above 3,000 AGL, it is safe to fail the engine with the mixture and ensure the student is able to react properly with the throttles.

The Only time the student will truly feather the propeller will be in flight above 3,000+ AGL which will allow plenty of time to troubleshoot in the event that the feathered prop does not come out of the feathered position once the maneuver is complete.

1. DURING THE TAKEOFF ROLL

- A. Performed shortly after break release before airspeed indicator comes alive
- B. Per the ACS: Require to be performed Before $\frac{1}{2}$ Vmc speed
- C. Simulate the engine failure with the **MIXTURE**
- D. If student does not immediately abort the takeoff with the throttles, you will need to bring both throttles to idle or if they are holding them tightly, both mixtures to idle to prevent a loss of directional control on the runway.

2. AFTER TAKE-OFF AT MINIMUM 400' AGL (PER THE ACS)

- A. Fail the engine with a **THROTTLE**
- B. Ensure student performs immediate action items
- C. Only **SIMULATE** Feather propeller (Touch and announce) DO NOT FEATHER
- D. Only **SIMULATE** Mixture to cut off (Touch and announce) DO NOT CUT OFF
- E. Instructor should then Simulate the students feathering by bringing the INOP throttle to 12" manifold pressure. (*Especially on a hot day, however, it may be beneficial to demonstrate to the student how an unfeathered prop decreases performance in the pattern by not increasing the throttle to 12"*)

3. ABOVE 3000'AGL

*NOTE: **3,000 is minimum recovery altitude required by the ACS, therefore, maneuver should truly be done at 4,000'+ AGL ***

- A. Fail with mixture
- B. Perform immediate action items
- C. Troubleshoot checklist
- D. Feather propeller
- E. Simulate engine secure procedures
- F. Cruise
- G. *once cruise is complete, simulation is over and can perform engine airstart checklist.

4. APPROACH TO LANDING

- A. Fail the engine with throttle, in the same manner as the after takeoff failure
- B. Ensure student performs immediate action items
- C. Only **SIMULATE** Feather propeller (Touch and announce) DO NOT FEATHER
- D. Only **SIMULATE** Mixture to cut off (Touch and announce) DO NOT CUT OFF
- E. Instructor should Simulate the students feathering by bringing the INOP throttle to 12" manifold pressure.