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FLIGHT MANEUVERS AND PROCEDURES

GENERAL PILOT INFORMATION

The following flight profiles show some normal and emergency operating procedures. They are designed as a general guide for ground training purposes. Actual in-flight procedures may differ due to aircraft configuration, weight, weather, traffic, ATC instructions, etc. Procedures outlined are consistent with the *Aircraft Flight Manual (AFM).* If a conflict should develop between these procedures and the *AFM,* the *AFM* procedures must be followed.

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Preflight Actions

Objective:
This procedure is designed to ensure that the pilot has taken the appropriate actions necessary to ensure the safety of the flight.

Description:
This procedure will include but is not necessarily limited to the following pre-flight actions:

1. Obtaining weather information
2. Performing weight & balance computations
3. Determining aircraft performance
4. Obtaining airport information
5. Determining airworthiness of aircraft
6. Recording of aircraft discrepancies
7. Complying with company flight following procedures

Acceptable Performance Guidelines:

1. Exhibits knowledge of elements related to the above mentioned preflight actions
2. Inspects the aircraft with reference to an appropriate checklist
3. Performs all preflight actions to the extent necessary to ensure the safety of the flight

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Engine Starting

Objective:
This procedure provides training and experience related to recommended engine starting procedures, including the use of an external power source, starting under various atmospheric conditions, awareness of other persons during start, and the effects of using incorrect starting procedures.

Description:

1. The actual procedure for starting the engine is found in the Pilots Operating Handbook and aircraft checklist. These procedures should be used at all times.
2. When ready to start the engine, the pilot should look around in all directions to be sure that nothing is in the vicinity of the propeller and that nearby persons and aircraft will not be struck by propeller blast.
3. As soon as the engine is operating smoothly, the oil pressure should be checked for proper indications to manufacturers specified value.

Acceptable Performance Guidelines:

1. Exhibits knowledge of the elements related to recommended engine starting procedures.
2. Accomplishes recommended starting procedures.
3. Completes appropriate checklists.

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Taxiing

Objective:
This procedure provides training for smooth, safe, and practical taxi operations.

Description:
When ready to taxi, add power while holding feet on brakes. Ensure that brakes hold, then release foot pressure on brake and let aircraft start to move. Taxi at a moderate speed and avoid making fast turns that put abnormal side loads on the landing gear. Maximum speed for taxiing should be that which would allow the aircraft to be safely controlled in the event of a brake failure. Unless passing close to another aircraft or object, the nose of the aircraft should always follow the painted taxi lines.

Notes:

- A 3-minute warm up is required for all cold engines. More in cold temperatures.
- Use the minimum power necessary. Excessive power erodes prop blades and blasts the surrounding area with debris.
- Always be aware of where your tail is pointed. We operate in a lot of soft field conditions where the people and equipment can get sand blasted.
- A brake check should be made at the start of taxi.
- Use rudder for steering – Not brakes!
- Speed control with the throttles first and then with brakes. If brakes are used, throttle should be at idle!
- Taxi speeds will show good professional judgment.
- Taxi using aft elevator to maximize the clearance of the prop from the ground and minimize propeller wear.

Acceptable Performance Guidelines:

A. Always test brakes before taxiing.
B. Maintain safe distances from other aircraft and objects.
C. Taxi at a safe speed with proper aileron and elevator control surface displacement.
D. Controls direction and speed without excessive use of brakes.
A. Complies with airport markings, signals and ATC clearances.
B. Completes the appropriate checklist.

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Pre-Takeoff Checks

Objective:
This procedure provides training and experience related to the before takeoff check, including the reasons for checking each item and how to detect malfunctions.

Description:
The pre-takeoff check is the systematic procedure for making a last minute check of the engine, controls, systems, instruments, and radio prior to flight. The airplane will be taxied to a position near the takeoff end of the runway, thus allowing sufficient time for the engine to warm up to minimum operating temperatures (bottom of green arc) and ensuring adequate lubrication of the many internal parts of the engine before being operated at high power settings. The engine run up shall not be performed while the aircraft is moving.

Checklist:
1) BRAKES – Set
2) CABIN DOORS AND WINDOWS – Closed and Locked
3) FUEL SELECTOR – Fullest tank
4) COWL FLAPS – Open
5) ELEVATOR + RUDDER TRIM –
   Set to takeoff setting. You can visually check the placement of the elevator trim by looking out of the right aft window and seeing that the position of the tab is level with the elevator.
5) MIXTURE – Rich
6) AUX PUMP SWITCH - Off
7) THROTTLE – Advance to 1700 rpm for engine run up

A) Check magnetos for a maximum drop of 150 rpm and a maximum differential between the two magnetos of 50 rpm.
B) Propeller cycle
C) Engine instruments, ammeter and suction gauge check for proper indications.

8) THROTTLE – Return to idle (1000 rpm's)
9) FLIGHT CONTROLS – Free and correct
10) FLIGHT INSTRUMENTS – Set DG, Altimeter
11) AUTOPILOT – If Installed - Off
12) RADIOS – Set
13) BRAKES – Release
14) HOLD ITEMS – To be completed right before takeoff
    A) Transponder on altitude and proper code selected
    B) Landing lights – On for all takeoffs and landings

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Acceptable Performance Guidelines:

A. Positions the airplane properly considering other aircraft, wind, and surface conditions.
B. Divides attention inside and outside the cockpit
C. Ensures engine temperature and pressures are suitable for run-up and takeoff.
D. Accomplishes before takeoff checks using the appropriate checklists
E. Reviews takeoff performance airspeeds, takeoff distances, departure and emergency procedures.
F. Ensures no conflict with traffic prior to taxiing into position
G. Completes appropriate checklists

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Normal Takeoff

Objective:
This maneuver describes methods and techniques to be employed during a normal takeoff.

Description:
Brief the instructor pilot on takeoff procedures prior to clearance for takeoff. This briefing should consist of at least the following: liftoff speed, best rate of climb speed, applicable power settings and what to do in case of engine failure.

During takeoff roll, monitor engine instruments and use whatever control displacement is needed to compensate for crosswind conditions and other variables, maintaining runway heading. Lift off should be made at the manufacturer's recommended takeoff speed for normal takeoff. The pitch attitude that will obtain the best rate of climb speed for the particular aircraft will be used until 500' AGL.

Note:
A. Because takeoff is the most critical phase of flight, careful attention should be given to the use of a checklist before every takeoff.
B. Throttle operation should be smooth and positive with thought given to "P" factor and mechanical strains on the engine.
C. The takeoff run should be maintained down the centerline to improve proficiency and to allow for blowouts or unexpected swerves.

Checklist:
1) WING FLAPS – Set to 10 degrees for all takeoffs
2) POWER – Set to red line limits of ____" of manifold pressure and ____ rpm for maximum power
3) MIXTURE – Adjust the mixture for red line fuel flow of ___ gal/hr
4) ELEVATOR – Aft, for a slightly tail low, nose high attitude to minimize prop erosion. The airplane will fly itself off of the ground, then accelerate in ground effect to climb speed.
5) CLIMB – Climb at Vy . Approximately 6 degree pitch
6) WING FLAPS – Retract after obstacles are cleared & at a safe altitude.

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Acceptable Performance Guidelines:

A. Speed +/- 5 knots of best liftoff speed and best rate of climb speed until 500' AGL.
B. Power use of full allowable power with smooth application.
C. Heading +/- 10 degrees of runway heading with no danger of control loss
D. If extended, retract flaps at a safe attitude. (Minimum of 50')
E. Maintains takeoff power to a safe maneuvering attitude, then sets climb power
F. Completes appropriate checklists.

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Normal Landing

Objective:
This maneuver provides training through the entire landing traffic pattern, including touchdown and rollout. It is used to develop proper techniques in power and control usage at low airspeeds during the critical phases of final approach and touchdown.

Description:
The before landing checklist will be completed before entering the traffic pattern. Unless otherwise directed by ATC, entry should be midfield, 45 degrees to the downwind leg at traffic pattern attitude. Speed should be reduced to that compatible with other aircraft in the pattern if practicable. When downwind opposite the point of touchdown, complete the landing checklist. Angle of bank should not exceed 30 degrees while in the traffic pattern. When established on final approach and landing flaps have been extended, stabilize airspeed to that recommended by the manufacturer. If a recommended airspeed is not furnished by the manufacturer. A speed equal to 1.3 Vso should be used. The approach should be planned so the landing will be made in the center of the first third of the runway, with a smooth transition from approach to landing attitude. The "after landing" checklist will not be accomplished until clear of the runway.

Checklist:
1) WING FLAPS – 0-10 degrees below ____ kts, 10-30 degrees below ____ kts.
2) AIRSPEED – ____ to ____ kts with flaps up, ____ to ____ kts with flaps down.
3) TRIM – Adjust to maintain the airspeed you picked
4) TOUCHDOWN – Mains first, then lower nosewheel gently.
5) BRAKES – Minimum necessary

Acceptable Performance Guidelines:

A. Selects a suitable touchdown point
B. Establishes the recommended approach and landing configuration and adjusts power and attitude as required.
C. Maintains a stabilized approach and recommended airspeed +5/-5 kts.
D. Touchdown at or within 200 ft beyond a specified point.
E. Touchdown should be on the runway centerline.
F. Ability to recover from any bounces or landing roll swerves without aid from the instructor pilot.
G. Completes appropriate checklists.

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Crosswind Takeoffs and Landings

Objective:
This maneuver provides training in the more complex control techniques and limitations of the aircraft during takeoff and landing with crosswind conditions.

Description:
Takeoffs:

Careful consideration should be given to the effects of a strong crosswind before taxiing to the takeoff position. Narrow wheel treads, high center of gravity and light weight when combined, result in an aircraft easily turned over in gusty cross and tail winds. At the start of the takeoff, the ailerons are displaced into the wind and rudder is used for directional control. As the nosewheel or tailwheel comes off the ground loop could result. The aircraft should remain in slipping flight until well clear of the ground and then allowed to crab into the wind to continue the flight path straight out on the runway extended centerline.

Landings:

On final approach, the crab will be changed to a slip. The force held on the controls is proportionate to the crosswind. The slip must keep the flight path and the longitudinal axis of the aircraft aligned with the runway centerline. As ground contact is made on the wheel into the wind, the controls are gradually moved further in the same direction to compensate for loss of control effectiveness as speed decreases.

Acceptable Performance Guidelines:

A. Guidelines from Normal Takeoff & Landing apply
B. Track maintained down centerline of runway for takeoff and landing
C. No drifting or crabbing at touchdown; no skipping or side loads imposed on gear
D. Control maintained so that no danger of ground loop exist. Correct flight path after takeoff
E. Completes appropriate checklists

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Short Field Takeoff

Objective:
This maneuver provides practice to develop proficiency in overcoming problems peculiar to marginal operations, which may be encountered while taking off from short fields.

Description:
It is impossible to specify a procedure that should be used for all situations involving the need for short field takeoff and climb techniques. Careful analysis of the field conditions and a thorough understanding of the aircraft operator's manual will determine what procedure should be used in a given situation. In any case, when the correct takeoff technique is used, the aircraft will reach liftoff speed with the minimum ground run to attain the selected initial climb speed. The existing obstacle situation dictates the climb speeds selected.

Short Field Takeoff (Hard Surface):

- The short field takeoff is made like a normal takeoff with the following differences. Starting from the farthest possible position downwind, the aircraft is accelerated on the ground roll until the airspeed approaches the best angle of climb speed. Rotate the aircraft to liftoff at the best angle of climb speed.

- If an obstacle climb is required, adjust the pitch attitude to maintain best angle of climb speed until clear of the obstacle (about 50' AGL when simulated), then pitch attitude is adjusted for best rate of climb speed. Upon reaching 500' AGL accelerate to cruise climb and reduce to climb power. If flaps are used, retract them after reaching a safe height.

- Follow the manufacturer's recommendations as to speeds, use of flaps, and power setting if different from those specified above.

- If an obstacle climb is not required, after liftoff adjust the pitch attitude for best rate of climb speed and at 500' AGL, accelerate to cruise climb and reduce to climb power.

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Checklist:

1. WING FLAPS – Set 10 degrees for all takeoffs
2. BRAKES – Apply. If on loose gravel, or sand, brakes should not be held unless runway
3. conditions make it necessary and then other options should be explored to keep debris from being thrown into the props; they are very expensive to replace. A full power takeoff with the brakes held on soft fields will not normally be used unless the conditions make it necessary
4. POWER – Set to ____ inches, _____ rpm and ____ gal/ hr fuel flow
5. BRAKES – Release
6. ELEVATOR – Slightly tail low
7. CLIMB – Rotate and climb at ___ KIAS. Approximately 8 degrees of pitch, until obstacles are cleared
8. WING FLAPS –Retract after obstacles are cleared and ____ kts is reached

Acceptable Performance Guidelines:

A. Establishes the recommended approach and landing configuration and airspeed.
B. Maintains a stabilized approach and recommended approach airspeed, or in it's absence, not more the 1.3 Vso, + 5 kts, with wind gust factor applied.
C. Touches down smoothly at minimum control airspeed.
D. Touches down at or within 100 feet beyond a specified point, with no side drift, minimum float and with the airplanes longitudinal axis aligned with and over the runway centerline.
E. Maintains crosswind correction and directional control throughout the approach and landing sequence.
F. Applies brakes as necessary to stop in the shortest distance consistent with safety.
G. Completes appropriate checklists.

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Short Field Landings

Objective:
This maneuver is practiced to develop proficiency in overcoming problems peculiar to marginal operations, which may be encountered while landing at short fields.

Description:
Short field landings should be made from a stabilized final approach in landing configuration. Manufacturer's recommended airspeed should be used with moderately low power and a constant rate of descent. The landing should be accomplished with little or no floating. Upon touchdown, the throttle should be closed immediately, accompanied by application of brakes to minimize the after landing roll.

Note: Extreme caution should be exercised when practicing short field landings at minimum speeds. At these speeds, high sinkrates may occur in some aircraft requiring excessive attitude and/or power for recovery.

Checklist:
1) WING FLAPS – Set to 30 degrees below ____ kts.
2) AIRSPEED – ____ KIAS
3) ELEVATOR TRIM – Adjust
4) POWER – Reduce to idle as obstacle is cleared
5) LAND – Main wheels first
6) BRAKES – Apply heavily
7) FLAPS – Retract for better breaking effectiveness
8) ELEVATOR – Full aft for aerodynamic braking and to place more weight on the main wheels.

Acceptable Performance Guidelines:

A. Maintains a stabilized approach at recommended airspeed but no more than 1.3 Vso +5/-5kts
B. Touches down at a point specified or within 100 ft beyond the point with little or no float or drift
C. Applies brakes as necessary to stop in the shortest distance consistent with safety
D. Completes appropriate checklists.

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Rejected Takeoff

Objective:
This maneuver provides training in positive aircraft control for stopping the aircraft if malfunctions occur during initial takeoff phase.

Description:
If takeoff is to be rejected, reduce power to idle and employ normal stopping procedures.

Note:

A. Practice rejected takeoffs will be executed at speeds of not more than 50% of normal liftoff speed.
B. Rejected takeoff will be executed on command of the instructor pilot

Checklist:
1) THROTTLE – Reduce to idle
2) BRAKES – Apply heavily
3) WING FLAPS – Retract
4) MIXTURE – Idle Cut-Off
5) IGNITION – Off
6) MASTER – Off

Acceptable Performance Guidelines:

A. Use of proper technique
B. Proper sequence of procedures
C. Positive directional control of aircraft

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Engine Failure Immediately After Takeoff

Objective:
To gain experience in carrying out the procedures necessary to execute a safe emergency landing in the event of an engine failure immediately after takeoff.

Description:
Prompt lowering of nose to maintain airspeed and establish a glide attitude is the first response to an engine failure after takeoff. In most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions. Altitude and airspeed are seldom sufficient to execute a 180 degree gliding turn necessary to return to the runway. The checklist procedures assure that adequate time exists to secure the fuel and ignition systems prior to touchdown.

Checklist:
1) AIRSPEED - Pitch for ____ kts
2) MIXTURE – Idle Cut-Off
3) FUEL SELECTOR – Off
4) IGNITION SWITCH - Off
5) FLAPS – As required. (30 degrees is recommended.)
6) MASTER SWITCH - Off

Acceptable Performance Guidelines:

A. Prompt reaction and response by the pilot
B. Demonstrates good judgment in selection of landing site
C. Use of mental checklist

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Normal Descent

Objective:
To provide practice in performing a normal descent.

Description:
Descent should be initiated far enough in advance of estimated landing to allow a gradual rate of descent at cruising speed. Just prior to beginning the descent, check that the auxiliary fuel has been shut off. Descent should be at approximately 500 fpm for passenger comfort, using enough power to keep the engine warm. The optimum engine rpm in a descent is usually the lowest rpm in the green arc range that will allow cylinder head temperature to remain in the recommended operating range.

Checklist:
1) COWL FLAPS – Closed
2) AUX PUMP SWITCH – OFF
3) MIXTURE – Lean for smoothness in power descents. Use full rich mixture for idle power.
4) POWER – Reduce power as needed, with a maximum reduction of 2 inches of manifold pressure per minute! You must plan ahead! Any reduction of manifold pressure greater than 2" per minute 'shock cools' the engine and greatly shortens the life of the engine. The engine is made of different types of metal that expand and contract at different rates and when the engine is rapidly cooled these metals contract differently causing stress cracks in the engine. A good rule of thumb is to plan your power reductions to arrive at the traffic pattern with 18 inches of manifold pressure.

Acceptable Performance Guidelines:

A. Uses appropriate descent checklist
B. Maintains engine temperature in normal operating range
C. Establish 500 fpm descent rate

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Emergency Descent

Objective:
To descent the airplane as rapidly as possible within the limitations of the airplane, to an altitude from which a safe landing can be made.

Description:
Before entering the maneuver, the area below must be free of other traffic. At no time should the airplane's Vno, or Vfe speeds be exceeded. Power should be reduced to idle, the propeller control should be placed full forward and full flaps should be extended for maximum drag, unless otherwise recommended by the manufacturer. A 30 degree to 45 degree bank angle should be maintained. Precautions should be taken to prevent excessive cooling of the engine.

Checklist:
1) SEAT AND SHOULDER BELTS – Secure
2) THROTTLE – Idle
3) PROPELLER – High RPM
4) MIXTURE – Full Rich
5) FLAPS – Up
6) AIRSPEED – 182 KIAS in Smooth Air otherwise use Maneuvering speed in rough air.
_____ lbs @ ____ KIAS
_____ lbs @ ____ KIAS
_____ lbs @ ____ KIAS

Acceptable Performance Guidelines:

A. The pilot configures the airplane appropriately
B. The pilot does not exceed any airspeed limitations
C. The pilot takes the necessary measures to keep engine from excessive cooling.
D. The pilot rolls out of the maneuver at the indicated altitude

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Go Around from a Rejected Landing

Objective:
This maneuver develops an understanding of airplane climb capabilities in the landing configuration.

Description:
This maneuver involves a go-around with the engine operating normally while in the final stages of a landing approach. All phases of the "before landing" checklist will have been completed. At any time on final approach, prior to actual touchdown, the instructor will command, "go-around". This will simulate a landing obstacle; such as, fire equipment, another aircraft, large animal, etc., moving onto the runway directly into the landing path; or, a sudden and violent shift in surface wind. The trainee will immediately apply maximum power and stop the descent. When descent has stopped, the flaps will be retracted and aircraft pitch adjusted to avoid altitude loss.

After a positive rate of climb is established, the aircraft is accelerated to Vy. From this point, the maneuver will be conducted in the same manner as a normal takeoff.

Checklist:
1) POWER – Set to ____ inches of manifold pressure
2) FLAPS – Retract to 20 degrees
3) AIRSPEED – Pitch for ____ knots
4) WING FLAPS – Retract slowly after obstacles are cleared and a safe altitude is obtained
5)COWL FLAPS – Open

Acceptable Performance Guideline:

A. Go-around initiated with correct sequence of events; ie, maximum power, flaps up, gear up
B. Angle of attack change to compensate for flap retraction
C. Airspeed + 10 – 0 knots
D. Complete the appropriate checklists

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No Flap Approach and Landing

Objective:
This maneuver provides training in making approaches and landing with simulated failure of components of the landing flap system.

Description:
No-flap landings will be conducted as a normal landing except without flaps and from a speed equal to 1.3 times the power-off stall speed with flaps retracted. The trainee should be aware that in most aircraft the touchdown will be in a higher than normal nose-up attitude, and that the landing roll will be longer due to the loss of drag caused by the no-flap condition and higher touchdown speed. The use of brakes may be required as dictated by runway length and surface.

Acceptable Performance Guidelines:

A. Touchdown is to be on or within 200 feet beyond desired point
B. Touchdown should be made on centerline of runway
C. Airspeed +/- 10 knots at boundary

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Simulated Forced Landing

Objective:
This maneuver affords the trainee practice in developing gliding distance judgement and planning required to land at a selected point when necessitated by engine failure during flight.

Description:
A simulated forced landing can be given with the aircraft in any configuration. The instructor will call "forced landing" and check that the throttle is closed. In order to obtain the best glide ratio, the cleanest configuration and best glide speed are normally established as soon as possible. If the airspeed is above the glide speed the trainee should maintain altitude. Place the aircraft in its cleanest configuration and allow airspeed to dissipate to best glide. Altitude permitting, the trainee should determine the best landing area available, maneuvering the aircraft as required to do so. The many variables; such as, altitude, obstructions, wind direction, landing direction, land surface, gradient, and landing distance requirements of the aircraft will determine the pattern and approach techniques used to complete the maneuver. The trainee should consider landing on a long field, crosswind; or uphill and downwind, if such a landing would be safer than directly into the wind on available landing areas.

Note:
During the glide and approach, the instructor will assure that measures are taken to keep the engine clear.

Utilizing any combination of normal gliding maneuvers, from wings level to spirals, the trainee is expected to eventually arrive at the normal "key" position at normal traffic pattern altitude for the selected landing area. From this point on, the approach is as nearly possible as a similar normal power-off approach, allowing the trainee to use his previous experience in judging his landing point.

Cockpit checks to determine cause of emergency are a part of this maneuver. Items appropriate to the aircraft being used will be covered; such as, changing fuel tanks, checking mixture controls, carburetor heat, and magnetos.

It is mandatory that the instructor and trainee know who is going to initiate the go-around and who will be flying the aircraft at that time. No simulated forced landing is to be carried below 200' AGL unless a safe landing is assured. Proximity of persons and structures must be considered when descending below 500' AGL.

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Checklist:

1) AIRSPEED – ____ KIAS with flaps up. ____ KIAS with flaps down
2) FUEL SELECTOR VALVE – Off
3) MIXTURE – Off
4) FLAPS – Set
5) IGNITION SWITCH – Off
6) MASTER SWITCH – Off
7) DOORS – Unlatch and push open and then rotate the handle down again while the door is open. This will keep the doors open
8) PASSENGER BRIEFING – Advise passengers on the appropriate actions to take upon landing
9) TOUCHDOWN – Slightly tail low and then apply brakes heavily

Acceptable Performance Guidelines:

A. Establishes best glide airspeed +/- 10 knots
B. Selects a suitable landing area, considering the possibility of an actual emergency landing
C. Altitude at key position +/- 200’ from normal pattern altitude
D. Prepare for low approach, landing or go around as specified by the examiner
E. Go-around initiated at 200’ AGL from a position where it is obvious that a safe landing could be made, or a landing completed on an approved landing area
F. Complete appropriate checklists

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Steep 360 Degree Power Turns

Objective:
To teach the trainee orientation, planning, coordination, and airplane control.

Description:
At the manufacturer's recommended entry airspeed, enter a steep turn using a bank attitude of at least 50 degrees to execute 360 degrees of turn. When entry airspeed is not recommended by the manufacturer, normal cruise airspeed or maneuvering speed – whichever is lower – will be used. Steep turns should be practiced, both left and right, and by rolling directly from one 360 degree turn into the other. In low powered airplanes, additional power should be added smoothly as the turn is established in order to maintain a safe airspeed. Entry and rollout rate should be consistent and executed with proper coordination.

Procedure Checklist:
1) HEIGHT – At least 1500 feet AGL.
2) AREA – Perform clearing turns
3) CONFIGURATION (FLOW) CHECK:
    FUEL SELECTOR – On Fullest Tank.
    COWL FLAPS - Closed
    WING FLAPS – Full Up (0 Degrees).
    MIXTURE – Set for Cruise
    PROPS – Set for Cruise
    THROTTLE – Set for _____ KIAS
    IGNITION - On
    MASTER SWITCH - On
    ENGINE INSTRUMENTS – In the Green
4) LANDING AREA – A suitable emergency landing area is within gliding distance.
5) MANEUVER PROCEDURE:
    REFERENCES – Select outside references
    ENTER 1st TURN – When airspeed and altitude are stabilized.
    AIRSPEED – Maintain _____ KIAS with power
    ALTITUDE – Maintain with pitch
    BANK ANGLE - Maintain
    ENTER 2nd Turn – At appropriate heading, enter the 2nd turn.
    ROLL OUT – At completion of 2nd turn, roll out on entry heading.

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Acceptable Performance Guidelines:

A. Altitude within +/- 100'
B. Bank within +/- 5 degrees
C. Heading +/- 10 degrees of entry heading
D. Maintains entry airspeed +/- 10 knots
E. Performance will be judged on the basis of coordination and smoothness

Maneuvering at Minimum Controllable Airspeed

Objective:
These maneuvers pre-stall demonstrate the degree of controllability available while in close proximity to the pre-install buffet. They provide the opportunity to practice control techniques which are most beneficial in the low speed regimes encountered during takeoffs, landings, and power plant failure emergency situations.

Descriptions:
Flight at minimum controllable airspeed is practiced in cruise and landing configurations and will consist of straight flight, turns, climbs, and descents. By definition, the term "Flight at minimum controllable airspeed" means a speed at which any further increase in angle of attack or increase in back pressure will cause an immediate physical indication of a stall. Stall warning devices on U.S. Certificated aircraft are required by regulation to be activated "at least 5 but not more than the greater of 10 knots, or 15% of the stalling speed, and must continue until the stall occurs". In view of the above requirements, flight at minimum controllable airspeed will result in activation of the stall warning device.

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Procedure Checklist:

1) HEIGHT – At least 1500 feet AGL.
2) AREA – Perform clearing turns
3) CONFIGURATION (FLOW) CHECK:
    FUEL SELECTOR – On Fullest Tank.
    COWL FLAPS - Closed
    WING FLAPS – Full Up (0 Degrees)
    MIXTURE - Rich
    PROPS – Full Forward
    THROTTLE – Set at slow cruise, _____".
    IGNITION - On
    MASTER SWITCH - On
    ENGINE INSTRUMENTS – In the Green
4) LANDING AREA – A suitable emergency landing area is within gliding distance.
5) MANEUVER PROCEDURE:
    THROTTLE – Retard slowly to approximately _____".
    WING FLAPS – Add one increment at a time as aircraft slows
    AIRSPEED – Reduce to MCA.
    HEADING – Maintain desired heading
    RUDDERS – Maintain coordinated flight.
    AT MINIMUM CONTROLLABLE AIRSPEED:
        THROTTLE – Adjust as necessary to maintain desired altitude
        PITCH – Adjust as necessary to maintain desired airspeed.
        TURNS – Shallow bank in both directions to desired heading.
    RECOVERY – Slowly add power and reduce flap setting while maintaining altitude and heading. Perform configuration check for cruise flight.

Acceptable Performance Guidelines:

A. Selects an entry altitude that will allow the task to be completed no lower than 1500 ft AGL
B. Stabilizes and maintains desired airspeed +/- 5 kts
C. Maintain specified altitude +/- 50 ft.
D. Maintains specified heading during straight flight +/- 10 degrees
E. Maintains specified bank angle +/- 10 degrees during turning flight
F. Rolls out a specified heading +/- 10 degrees
G. Establishes straight & level flight and level turns, with gear and flaps selected as specified by the examiner

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Stalls and Approaches to Stalls

Objective:
To develop in the trainee a "feel" for the flight characteristics in stalls and approaches to stalls. To teach the trainee to react instinctively and correctly in stall recovery.

Description:
Stalls will be practiced under the two most critical operating conditions: Takeoff/Departure and Approach to landing.

A. Takeoff/Departure stalls will be performed straight ahead and from 15 to 20 degrees constant banked turns in takeoff configuration. The climb will be entered at liftoff speed while adding power. The angle of attack will be gradually increased until a stall occurs. At least 50-60 % power should be be used.
B. Approach to landing stalls are performed from straight glides and moderately banked gliding turns (not to exceed 30 degrees) in landing configuration. The demonstration is entered at landing approach speed and gradually reduced until a stall occurs. Idle power, or the power that would be used for a normal approach, should be used.

Deactivation of stall warning devices is prohibited if they are required equipment.

Recovery will be initiated as soon as evidence of a stall is recognized, or when full-up elevator will not result in a stall.

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TAKEOFF/ DEPARTURE STALLS

Procedure Checklist:

1) HEIGHT – At least 1500 feet AGL.
2) AREA – Perform clearing turns
3) CONFIGURATION (FLOW) CHECK:
    FUEL SELECTOR – On Fullest Tank.
    COWL FLAPS - Open
    WING FLAPS – Full Up (0 Degrees)
    MIXTURE – Set for Takeoff
    PROPS – Set for Takeoff
    THROTTLE – Set for ____".
    IGNITION - On
    MASTER SWITCH - On
    ENGINE INSTRUMENTS – In the Green
4) LANDING AREA – A suitable emergency landing area is within gliding distance.
5) MANEUVER PROCEDURE:
    THROTTLE – Reduce power slowly to ____" to reduce shock cooling.
    WING FLAPS – Takeoff Configuration (0 to 10 Degrees).
    AIRSPEED – Reduce to below ____ KIAS
    HEADING – Maintain heading or establish bank angle for stall in a turn.
    RUDDERS – Maintain coordinated flight.
    PITCH – Establish a climb pitch attitude at ____ IAS while increasing power to approximately ____ to ____".
    STALL – Continue to increase pitch attitude until an imminent stall develops.
    RECOVERY – At stall, lower nose to horizon and add power. Regain airspeed and retract flaps, climb out at Vy .

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APPROACH TO LANDING STALLS

Procedure Checklist:

1) HEIGHT – At least 1500 feet AGL.
2) AREA – Perform clearing turns
3) CONFIGURATION (FLOW) CHECK:
    FUEL SELECTOR – On Fullest Tank.
    COWL FLAPS - Closed
    WING FLAPS – Full Up.
    MIXTURE – Set for Landing
    PROPS – Set for Landing
    THROTTLE – Set at slow cruise, _____"
    IGNITION - On
    MASTER SWITCH - On
    ENGINE INSTRUMENTS – In the Green
4) LANDING AREA – A suitable emergency landing area is within gliding distance.
5) MANEUVER PROCEDURE:
    THROTTLE – Reduce power slowly to ____" to reduce shock cooling.
    WING FLAPS – Add wing flaps incrementally to landing configuration.
    AIRSPEED – Reduce to _____ KIAS.
    HEADING – Maintain heading or establish bank angle for stall in a turn.
    RUDDERS – Maintain coordinated flight.
    PITCH – Establish an approach to landing pitch attitude at _____ KIAS.
    STALL – At designated altitude, slowly increase pitch and reduce power until an imminent stall develops.
    RECOVERY – At stall, lower nose to horizon and add power. Regain airspeed and retract flaps, climb out at Vy .

Acceptable Performance Guidelines:

A. Recognizes and announces the onset of the stall by identifying the 1st Aerodynamic buffeting or decay of control effectiveness
B. Prompt and correct control application
C. No secondary stalls. No abrupt pitch changes during recovery
D. Heading +/- 10 degrees where applicable
E. Bank angle +/- 10 degrees in turning flight

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After Landing Checklist

Objective:
To provide training and experience related to performing after landing procedures, including local and ATC procedures.

Description:
During the after landing roll, the airplane should be gradually slowed to normal taxi speed before turning off the landing runway. The after landing checklist should be performed only after the airplane is brought to a complete stop clear of the runway.

Acceptable Performance Guidelines:

A. Clears runway/landing area, taxies to suitable parking/refueling area using proper wind correction and obstacle clearance procedures
B. Complete appropriate checklists

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Securing Aircraft

Objective:
To provide training and experience related to ramp safety, parking signals, shutdown, securing, and post flight inspection.

Description:
A flight is never complete until the engine is shut down and the airplane secured. Unless parking in a supervised, designated area, the pilot should select a location and heading which will prevent the propeller or jet blast of other airplanes from striking the airplane broadside. Whenever possible the airplane should be parked headed into the existing wind. After stopping on the desired heading, the airplane should be allowed to roll straight ahead enough to straighten the nose wheel. Finally, the pilot should always use the procedures in the manufacturers checklist for shutting down the engine and securing the aircraft. When away from base of operations, be sure to install control lock. If tie downs are available, tie down the airplane. If tie downs are not available, place wheel chocks around each main wheel.

Acceptable Performance Guidelines:

A. Parks the airplane properly, considering the safety of nearby persons and property
B. Follows the recommended procedure for shutdown, securing the cockpit, and deplaning passengers
C. Secures the airplane properly
D. Performs a satisfactory post flight inspection
E. Complete appropriate checklists

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Emergency Procedures

Objective:
To provide training and experience related to causes, indication, and pilot actions for various systems and equipment malfunctions.

Description:
The pilot will analyze the following situations and take appropriate actions:

Checklists:

A) ENGINE FAILURE DURING FLIGHT (RESTART PROCEDURES):

1) AIRSPEED – Pitch for best glide speed: _____ KIAS @ _____ lbs.
   _____ KIAS @ _____ lbs.
2) AUX. FUEL PUMP – On
3) FUEL SELECTOR – Select opposite tank (if it contains fuel)
4) THROTTLE – Half Open
5) AUX. FUEL PUMP – Off. Monitor fuel flow; if it drops to zero, your engine driven fuel pump has failed and the Aux. Fuel Pump should be returned to the on position
6) MIXTURE – Lean from full rich until combustion occurs. If prop has stopped, turn ignition switch to start.
7) MIXTURE – Adjust as required as power is restored.
8) THROTTLE – Adjust as required if power is restored
9) FUEL SELECTOR VALVE – As desired after fuel flow stabilizes.

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B) FIRE DURING START

1) IGNITION SWITCH – Continue cranking to obtain start and to suck the flame out of the exhaust stack
2) AUX. FUEL PUMP – Off. Don't use to attempt start.

If engine starts, run at _____ rpm for a few minutes

3) ENGINE – Shutdown and inspect for damage

If engine does not start, continue cranking engine

4) THROTTLE – Full open (forward)
5) MIXTURE – Idle Cut-off.
6) FIRE EXTINGUISHER – Obtain from under your seat
7) ENGINE – SECURE: Ignition – Off
   Master – Off
   Fuel Selector – Off
8) AIRPLANE – Evacuate
9) EXTINGUISHER – Apply and, if able, move aircraft away from fire if on ground

C) ENGINE FIRE IN FLIGHT

1) MIXTURE – Idle Cut-Off
2) FUEL SELECTOR – Off
3) MASTER SWITCH – Off
4) CABIN HEAT AND AIR – Off (except overhead vents)
5) AIRSPEED – _____ KIAS if fire is not extinguished, increase glide speed to put out fire.
6) FORCED LANDING – Execute

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D) ELECTRICAL FIRE IN FLIGHT

1) MASTER SWITCH – Off
2) AVIONICS SWITCH – Off
3) SWITCHES – All OFF except for ignition switch.
4) Cabin air, Cabin heat and overhead vents - Closed or Off
5) FIRE EXTINGUISHER –Activate if required

If fire is out and electrical power is needed for continuation of flight:

(Note: If you are Day VMC, you most likely do NOT need to restore electrical power. If you do require electrical power, first try to determine the source of the fire by looking for a popped or hot circuit breaker or a switch that is very warm.)

6) Master Switch – ON
7) Circuit Breakers – Check for faulty circuit; do not reset
8) Radio Switches – OFF
9) Avionics Power Switch – ON
10) Radio / Electrical Switches – ON one at a time, with delay after each until short circuit is localized.
11) Vents/ Cabin air/ Heat – OPEN when it is ascertained that fire is completely extinguished.

E) CABIN FIRE

1) MASTER SWITCH – Off
2) Cabin air, heat and vents - Closed or Off
3) FIRE EXTINGUISHER – Activate
4) LAND – As soon as possible to have damage inspected

F) WING FIRE

1) NAVIGATION LIGHT SWITCH - Off
2) STROBE LIGHTS – Off
3) PITOT HEAT – Off
4) Sideslip as necessary to keep flames away from fuel tanks and cabin
5) Land as soon as possible

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G) TURBULENCE

1) SEAT AND SHOULDER BELTS – Secure
2) MIXTURE – Full Forward
3) PROP – High RPM
4) THROTTLE – Reduce
5) WING FLAPS – UP (Lowering Wing Flaps will reduce stall speed and make structural damage more likely.)
6) AIRSPEED – Reduce to a maximum of: _____KIAS @ _____ lbs
_____KIAS @ _____ lbs

H) PRECAUTIONARY LANDINGS

1) AIRSPEED – _____ KIAS
2) WING FLAPS – 10 degrees
3) LANDING SPOT – Fly over and note terrain conditions
4) ELECTRICAL SWITCHES - OFF
5) WING FLAPS – 30 degrees on final
6) AIRSPEED – _____ KIAS
7) AVIONICS SWITCH – Off
8) MASTER SWITCH – Off
9) DOORS – Unlatched and then locked in the open position
10) PASSENGER BRIEFING – Completed
11) LANDING – Tail low, maximum braking
12) MIXTURE – Idle Cut-Off
13) IGNITION – Off

Acceptable Performance Guidelines:

A. Follows the appropriate emergency checklists or procedures

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Constant Rate Climbs & Descents

Objective:
This maneuver will provide training and experience related to attitude instrument flying during climbs and descents.

Description:
During these maneuvers, pitch attitude control is used to establish and maintain the vertical velocity while power is used to control the airspeed. A constant rate climb is established by increasing back pressure while simultaneously applying power. Once the pitch attitude has been established to produce the desired rate of climb, the power is adjusted to maintain the desired airspeed.

Acceptable Performance Guidelines:

A. Demonstrates climbs and descents at a constant rate in straight and turning flight
B. Maintains specified rate of descent within 100 fpm
C. Maintains airspeed within 10 knots, heading within 10 degrees, of it turning, within 5 degrees of the specified bank angle
D. Performs level off within 100 feet of the specified altitude
E. Uses proper instrument cross check and interpretation and applies the appropriate corrections.

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Constant Airspeed Climbs & Descents

Objective:
This maneuver provides training and experience related to attitude instrument flying during constant airspeed climbs and descents.

Description:
When making a descent airspeed is reduced to the desired airspeed by reducing power while maintaining straight & level flight. When the descent airspeed is reached, a further reduction in power is made and simultaneously the nose is lowered to maintain a constant airspeed. The power should remain at fixed position and deviations in airspeed should be corrected by making pitch changes. Do not jockey the throttle.

When starting a climb from cruising airspeed, the nose of the airplane on the attitude indicator is raised in relation to the artificial horizon to the approximate climbing attitude. Only a small amount of elevator back pressure should be added to initiate and maintain the climb attitude. The power setting may be advanced to climb power simultaneously with the pitch change, or, after the pitch change is established and the airspeed approaches the desired climb speed.

Acceptable Performance Guidelines:

A. Demonstrate climb and descents at a constant airspeed in straight and Turning flight
B. Maintains airspeed within 10 knots
C. Maintains heading within 10 degrees, or in a turning maneuver, within 5 degrees of specified bank angle
D. Performs level off within 100 feet of the specified altitude
E. Uses proper instrument cross check and interpretation and applies the appropriate corrections

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Recovery from Unusual Attitudes

Objective:
This maneuver will provide training and experience related to recovery from unusual attitudes while attitude instrument flying.

Description:
Unusual attitudes are normally the result of improper instrument flying technique, distraction or turbulence. The recovery procedures, with the attitude indicator functional are first to determine if the attitude is nose high or nose low. For nose high, the steps are, add power, decrease attitude and level wings. For nose low attitude, reduce power first, level the wings, and raise the nose of the aircraft to straight and level flight.

Acceptable Performance Guideline:

A. Uses proper instrument cross check and interpretation, and applies the appropriate pitch, bank and power corrections in the correct sequence to return the aircraft to a stabilized level flight attitude

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Timed/Compass Turns

Objective:
This maneuver will provide training and experience related to the operating characteristics and errors of the magnetic compass, the performance of timed turns and compass turns to specified headings.

Description:
Timed turns are made by initiating a standard rate turn with reference to the turn coordinator. This type of turn results in a heading change at the rate of three degrees per second. At the end of the predetermined number of seconds required to make the desired heading change, the pilot should begin to roll out of the turn. Turns to specific headings, may also be performed while taking into account the magnetic dip errors of the compass.

Acceptable Performance Guidelines:

A. Establishes indicated standard rate turns, both left and right
B. Makes timed turns to specified headings
C. Makes compass turns to specified headings
D. Maintains altitude within 100 feet
E. Maintains standard rate turns - / + 5 degrees
F. Turns to specified heading within 10 degrees
G. Turns to a northerly hading must be stopped by a predetermined amount prior to the desired heading being indicated on the magnetic compass
H. Turns to a southerly heading must be stopped by a predetermined amount after the desired heading is indicated on the magnetic compass

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Intercepting & Tracking VOR Radials

Objective:
This maneuver provides training and experience related to intercepting and tracking VOR radials both inbound and outbound.

Description:
During this procedure the pilot will tune and correctly identify the navigation facility. He will set and correctly orient the radial to be intercepted into the course selector. The pilot will then intercept the specified radial at a predetermined angle inbound or outbound from a navigational facility. The pilot will then apply the proper correction to maintain the radial. Finally, the pilot will be able to recognize navigational receiver or facility failure, and when required, report the failure to ATC.

Acceptable Performance Guidelines:

A. Maintains the airspeed within 10 knots
B. Maintains altitude within 100 feet
C. Maintains selected heading within 5 degrees
D. Allows no more than a three-quarter scale deflection of the CDI while Maintaining a radial

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Instrument Approach Procedure:

Objective:
This procedure will provide training and experience related to performing an instrument approach procedure.

Description:

- The pilot will comply with the appropriate instrument approach procedure selected by the instructor or examiner. The pilot will establish two-way radio communication with ATC, as appropriate to the phase of flight or approach segment and will use proper radio communication phraseology and technique.

- The pilot will select, tune, identify and confirm the operational status of navigation equipment to be used for the approach procedure.

- The pilot will comply with all clearances issued by ATC and will advise ATC anytime the aircraft is unable to comply with a clearance.

- The pilot will establish the appropriate aircraft configuration and airspeed considering turbulence and wind shear, and completes the aircraft checklist items appropriate to the phase of flight.

- For a non-precision approach, the pilot will establish a rate of descent and track that will ensure arrival at the MDA prior to the reaching the MAP with the aircraft continuously in a position from which descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.

- For a precision approach, the pilot will establish a rate of descent that will track the glideslope to the DH.

- The pilot will execute a missed approach procedure when the required visual references for the intended runway are not distinctively visible and identifiable at the MAP or DH.

- The pilot will execute a normal landing from a straight in or circling approach when instructed by the instructor or examiner.

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Acceptable Performance Guidelines:

A. Maintains prior to beginning the final approach segment, altitude within 100 feet, heading within 10 degrees, and allows less than a full scale deflection of the course deflection zone and maintains airspeed within 10 knots
B. Allows, while on the final approach segment, no more than a three-quarter scale deflection of the course deflection zone and maintains airspeed with 10 knots
C. Maintains the MDA, when reached, within + 100 feet / -0 feet to the MAP

Missed Approach Procedure

Objective:
This procedure will provide training and experience related to missed approach procedures associated with standard instrument approaches.

Description:
The pilot will execute a missed approach procedure by promptly applying power, establishing a climb attitude, and reducing drag in accordance with the aircraft manufacturers recommendations. The pilot will report to ATC beginning the missed approach procedure will comply with the published or alternate missed approach procedure. The pilot will then follow the recommended checklist items appropriate to the go-around procedure.

Acceptable Performance Guidelines:

A. Maintains recommended airspeed within 10 knots
B. Maintains heading or course within 10 degrees
C. Maintains altitude with 100 feet
D. Completes approach checklist