NORMAL PROCEDURES

TABLE OF CONTENTS

INTRODUCTION

Pilot's Operating Handbook (POH) Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated optional systems can be found in *POH* Section 9.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 3100 pounds and may be used for any lesser weight. However, to achieve the performance specified in *POH* Section 5 for takeoff distance, the speed appropriate to the particular weight must be used.

Takeoff:
- Normal Climb Out ..... 70-80 KIAS
- Short Field Takeoff, Flaps 20°, Speed at 50 Feet .... 55 KIAS

Enroute Climb, Flaps and Gear Up:
- Normal ..... 90-100 KIAS
- Best Rate-of-Climb, Sea Level ..... 88 KIAS
- Best Rate-of-Climb, 10,000 Feet ..... 74 KIAS
- Best Angle-of-Climb, Sea Level ..... 64 KIAS
- Best Angle-of-Climb, 10,000 Feet ..... 66 KIAS

Landing Approach:
- Normal Approach, Flaps Up ..... 70-80 KIAS
- Normal Approach, Flaps 40° ..... 65-75 KIAS
- Short Field Approach, Flaps 40° ..... 63 KIAS

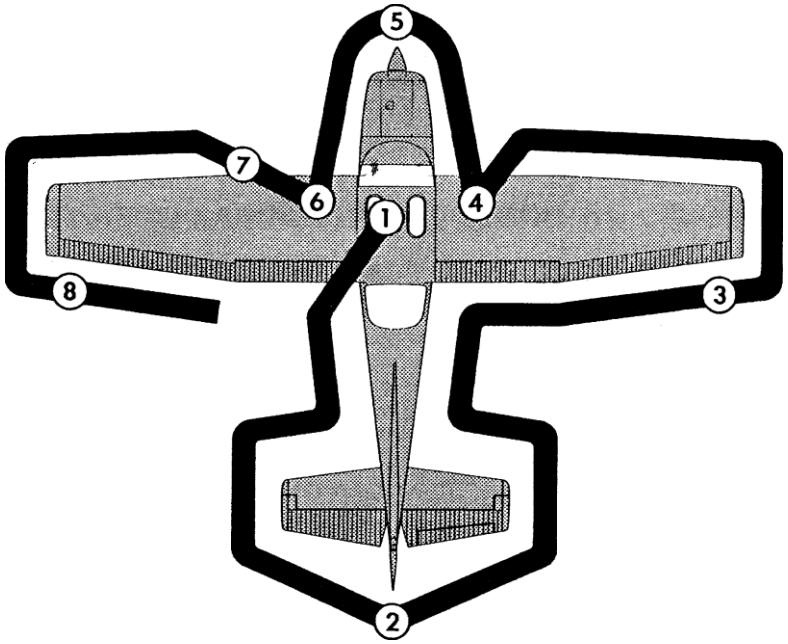
Balked Landing:
- Maximum Power, Flaps 20° ..... 75 KIAS

Maximum Recommended Turbulent Air Penetration Speed:
- 3100 lbs ..... 112 KIAS
- 2550 lbs ..... 101 KIAS
- 2000 lbs ..... 89 KIAS

Maximum Demonstrated Crosswind Velocity:
- Takeoff or Landing ..... 18 KNOTS

NOTE

Italic text in this checklist indicates a modification to the checklist in the Owner's Manual.



NOTE

Visually check airplane for general condition during walk-around inspection. *Airplane should be parked in a normal ground attitude to ensure that fuel drain valves allow for accurate sampling. Use a ladder to access the upper wing surfaces for visual checks and refueling operations.* In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Preflight Inspection

PREFLIGHT INSPECTION

(1) *CABIN*

1. *Windshield -- CLEAN as required.*
2. *Pitot Tube Cover -- REMOVE. Check for pitot stoppage.*
3. *Nose Plugs -- REMOVE. Check for air intake blockage.*
4. *Documents/Hobbs/Tach -- CHECK*
5. Pilot's Operating Handbook *and Flyaway Notebook* -- AVAILABLE IN THE AIRPLANE.
6. Landing Gear Lever – DOWN.
7. Control Wheel Lock -- REMOVE.
8. Ignition Switch -- OFF. *Place keys on glare shield*.
9. Avionics Power Switch -- OFF.
10. Master Switch -- ON.

WARNING

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire or a component malfunction could cause the propeller to rotate.

11. Fuel Quantity Indicators -- CHECK QUANTITY.
12. Landing Gear Position Indicator Light (green) -- ILLUMINATED.
13. *Flashing Beacon and Strobes -- CHECK*
14. *Interior Lights, Navigation Lights, and Landing Light -- CHECK for night operations*
15. *Flaps -- EXTEND.*
16. *Pitot Heat – ON as required. (Carefully check that pitot tube is warm to touch within 30 seconds.)*
17. *Pitot Heat -- OFF.*
18. Master Switch -- OFF.
19. Fuel Selector Valve -- BOTH. *Check movement RIGHT, LEFT, OFF then set to BOTH.*
20. Static Pressure Alternate Source Valve -- OFF.
21. *Elevator Trim -- SET for takeoff.*
22. Baggage Door – CHECK for security, lock with key.

(2) *EMPENNAGE*

1. *Autopilot Static Source Opening (both sides) -- CHECK for blockage.*
2. Rudder Gust Lock *(if installed)* -- REMOVE.
3. Tail Tie-Down -- DISCONNECT.
4. Control Surfaces -- CHECK freedom of movement and security.
5. *Trim Tab -- CHECK for security.*

(3) *RIGHT WING Trailing Edge*

1. Aileron -- CHECK freedom of movement and security.
2. *Flap -- CHECK for security and condition.*

(4) *RIGHT WING*

1. Wing Tie-Down -- DISCONNECT.
2. Fuel Tank Vent Opening -- CHECK for stoppage.
3. Main Wheel Tire -- CHECK for proper inflation *and general condition (weather checks, tread depth and wear, etc...).*
4. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment, and proper fuel grade. *If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly airplane.*

   WARNING

   If, after repeated sampling, evidence of contamination still exists, the airplane should not be flown. Tanks should be drained and system purged by qualified maintenance personnel. All evidence of contamination must be removed before further flight.

5. Fuel Quantity -- CHECK VISUALLY for desired level.
6. Fuel Filler Cap -- SECURE and vent unobstructed.

(5) *NOSE*

1. Static Source Opening (both sides of fuselage) -- CHECK for stoppage.
2. Engine Oil Level -- CHECK. Do not operate with less than five quarts. Fill to eight quarts for extended flight.
   RAFA Procedure: If below 6 quarts – add 1 quart.
3. Before first flight of the day and after each refueling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. Check strainer drain closed. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel tank sumps, and fuel selector valve drain plug will be necessary. *If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING above and do not fly airplane.*
4. *Engine Cooling Air Inlets -- CLEAR of obstructions.*
5. Propeller and Spinner -- CHECK for nicks and security.
6. *Propeller Hub -- CHECK for oil leaks.*
7. Landing Lights -- CHECK for condition and cleanliness.
8. Carburetor Air Filter -- CHECK for restrictions.
9. Nose Wheel Strut and Tire -- CHECK for proper inflation *of strut and general condition (weather checks, tread depth and wear, etc...) of tire*.
10. Nose Tie-Down *(if installed)* -- DISCONNECT.

(6) *LEFT WING*

1. Main Wheel Tire -- CHECK for proper inflation *and general condition (weather checks, tread depth and wear, etc...).*
2. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick- drain valve to check for water, sediment and proper fuel grade. *If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING above and do not fly airplane.*
3. Fuel Quantity -- CHECK VISUALLY for desired level.
4. Fuel Filler Cap -- SECURE and vent unobstructed.

(7) *LEFT WING Leading Edge*

1. Pitot Tube Cover -- *Verify* REMOVE*D* and check opening for stoppage.
2. Fuel Tank Vent Opening -- CHECK for stoppage.
3. Stall Warning Vane -- CHECK for freedom of movement while master switch is momentarily turned ON (horn will sound when vane is momentarily pushed upward).
4. Wing Tie-Down -- DISCONNECT.

(8) *LEFT WING Trailing Edge*

1. Aileron-- CHECK for freedom of movement and security.
2. *Flap -- CHECK for security and condition.*

STARTING

PREPARE FOR STARTING

(1) *Surrounding Area -- CHECK for personnel and hazards. REMOVE chocks and tow bar.*
(2) *Master Switch -- ON.*
(3) *Avionics Power Switch -- ON.*
(4) *Radios -- SET (comm and nav).*
(5) *Weather -- CHECK (ATIS/ASOS/AWOS).*
(6) *Avionics Power Switch -- OFF.*
(7) *Master Switch -- OFF.*
(8) *Passenger Briefing -- COMPLETE.*
(9) *Flight Plan -- OPEN.*

BEFORE STARTING ENGINE

(1) Preflight Inspection -- COMPLETE.
(2) Seats, *Seat* Belts, Shoulder Harness -- ADJUST and LOCK.
(3) Brakes -- TEST and SET.
(4) Circuit Breakers -- CHECK IN.
(5) *Avionics Circuit Breakers -- CHECK IN.*
(6) Electrical Equipment -- OFF.
(7) Autopilot -- OFF.
(8) Avionics Power Switch -- OFF.

CAUTION

The avionics power switch must be OFF during engine start to prevent possible damage to avionics.

(9) Fuel Selector Valve -- BOTH.
(10) Cowl Flaps -- OPEN (move lever out of locking hole to reposition).
(11) Landing Gear Lever – DOWN.

STARTING ENGINE

(1) Mixture -- *FULL* RICH.
(2) Carburetor Heat -- COLD.
(3) Propeller -- HIGH RPM *(full in)*.
(4) Throttle – PUMP once, or as many as six times if engine is very hot; leave open ¼ inch.
(5) Master Switch -- ON.
(6) *Flashing Beacon -- ON.*
(7) *Navigation Lights -- ON for night operations.*
(8) Propeller Area -- *SHOUT "*CLEAR *PROP" and check propeller area.*
(9) Ignition Switch -- START (release when engine starts).
(10) *Throttle -- 1000 to 1200 RPM. Lean for smooth operation.*
(11) Oil Pressure -- CHECK.

NOTE

After starting, check for oil pressure indication within 30 seconds in normal temperatures and 60 seconds in cold temperatures. If no indication appears, shut off engine and investigate.

(12) *Navigation Lights -- ON as required.*
(13) *Avionics Power Switch -- ON.*
(14) *Transponder -- SQUAWK 1200 ALT or ATC assigned code.*
(15) *Flaps -- RETRACT (verify visually).*

TAXI *– Review checklist before movement, do not read while taxiing.*

(1) *Throttle -- Maintain 1000 to 1200 RPM for ground operations.*
(2) *Mixture -- LEAN for Taxi.*
(3) *Radio -- REQUEST TAXI CLEARANCE or announce intentions.*
(4) *Brakes -- CHECK during initial movement.*
(5) *Nose Wheel Steering – CHECK.*
(6) *Ailerons -- POSITION for crosswind taxi.*
(7) *Flight Instruments -- CHECK for proper movement during taxi.*

BEFORE TAKEOFF

(1) Parking Brake -- SET.
(2) *Seats, Seat Belts, Shoulder Harnesses -- CHECK SECURE.*
(3) Cabin Doors and Windows -- CLOSED and LOCKED.
(4) Flight Controls -- FREE and CORRECT.
(5) Flight Instruments -- SET.
(6) *Fuel Quantity -- CHECK.*
(7) Mixture – *FULL* RICH.
(8) Auxiliary Fuel Pump – ON (check for rise in fuel pressure), then OFF.

NOTE

In flight, gravity will normally supply satisfactory fuel flow if the engine-driven fuel pump should fail. However, if a fuel pump failure causes the fuel pressure to drop below 0.5 psi, use the auxiliary fuel pump to assure proper engine operation.

(9) Fuel Selector Valve -- *Recheck* BOTH.
(10) Cowl Flaps -- *Recheck* OPEN.
(11) Throttle -- 1700 RPM.
   a. Magnetos -- CHECK (RPM drop should not exceed 175 RPM on either magneto or 50 RPM differential between magnetos).
   b. Propeller – CYCLE high-to-low-*to-high* RPM. *(< 300 RPM drop.)*
      Cycle three times if engine was cold at starting.
      Cycle one time if engine was hot at starting.
      Return to high RMP (full in).
   c. Carburetor Heat -- CHECK for RPM drop.
   d. Engine Instruments and Ammeter -- CHECK.
   e. Suction Gage -- CHECK.
(12) *Throttle -- 1000 to 1200 RPM.*
(13) Throttle Friction Lock -- ADJUST.
(14) Radios *and Avionics* -- SET *(Program GPS if needed).*
(15) Autopilot -- OFF.
(16) Flashing Beacon, Navigation Lights and Strobe Lights -- ON as required.
(17) Elevator and Rudder Trim -- TAKE-OFF.
(18) *Wing Flaps -- SET for takeoff (0°-20°).*
(19) *Radio -- REQUEST TAKEOFF CLEARANCE or announce intentions.*
(20) Parking Brake -- RELEASE.

TAKEOFF

NORMAL TAKE-OFF

(1) Wing Flaps -- 0°- 20°.
(2) Carburetor Heat -- COLD.
(3) Power -- FULL THROTTLE and 2400 RPM.
(4) *Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).*
(5) Elevator Control -- LIFT NOSE WHEEL (at 50 KIAS).

NOTE

When the nose wheel is lifted, the gear motor may run 1-2 seconds to restore hydraulic pressure.

(6) Climb Speed -- 70 KIAS (flaps 20°).
80 KIAS (flaps UP).
(7) Brakes -- Apply momentarily when airborne.
(8) Landing Gear -- RETRACT in climb out.
(9) Wing Flaps -- RETRACT *slowly (after reaching 75 KIAS and clear all obstacles).*

SHORT FIELD TAKEOFF

(1) Wing Flaps -- 20°.
(2) Carburetor Heat -- COLD.
(3) Brakes -- APPLY.
(4) Power -- FULL THROTTLE and 2400 RPM.
(5) *Mixture -- FULL RICH (unless engine is rough).*
(6) Brakes -- RELEASE.
(7) Elevator Control – MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
(8) Climb Speed -- 55 KIAS until all obstacles are cleared.
(9) Landing Gear – RETRACT after obstacles are cleared.
(10) Wing Flaps -- RETRACT slowly (after reaching 75 KIAS *and clear all obstacles).*

SOFT FIELD TAKEOFF

(1) *Wing Flaps -- 20°.*
(2) *Carburetor Heat -- COLD.*
(3) *Elevator -- FULL AFT*
(4) *Power -- FULL THROTTLE (slowly) and 2400 RPM.*
(5) *Mixture -- FULL RICH (unless engine is rough).*
(6) *Roll -- Maintain nose-high attitude with minimum weight on nose wheel.*
(7) *Elevator Control -- LIFT AIRCRAFT off ground as soon as practical.*
LEVEL AIRCRAFT just above runway surface.
ACCELERATE to appropriate airspeed for climb.
(8) Landing Gear – RETRACT.
(9) Wing Flaps -- RETRACT slowly after reaching 75 KIAS *and 50 feet).*

ENROUTE CLIMB

NORMAL CLIMB

(1) Airspeed -- 90-100 KIAS.
(2) Power -- 23 INCHES Hg and 2400 RPM.
(3) Fuel Selector Valve -- BOTH
(4) Mixture -- FULL RICH (mixture may be leaned above 3000 feet).
(5) Cowl Flaps -- OPEN as required.

MAXIMUM PERFORMANCE CLIMB

(1) Airspeed -- 88 KIAS at sea level to 75 KIAS at 10,000 feet.
(2) Power -- FULL THROTTLE and 2400 RPM.
(3) Fuel Selector Valve -- BOTH
(4) Mixture -- FULL RICH (mixture may be leaned above 3000 feet).
(5) Cowl Flaps -- FULL OPEN.

CRUISE

(1) Power -- 15-23 INCHES Hg, 2100-2400 RPM (no more than 75% power).
(2) Elevator and Rudder Trim -- ADJUST.
(3) Mixture -- LEAN.
(4) Cowl Flaps -- CLOSED.

DESCENT

(1) Power -- AS DESIRED.
(2) Carburetor Heat -- AS REQUIRED to prevent carburetor icing.
(3) Mixture -- ENRICHEN as required.
(4) Cowl Flaps -- CLOSED.
(5) *Fuel Selector Valve -- BOTH.*
(6) Wing Flaps -- AS DESIRED (0° - 10° below 140 KIAS,
10° - 40° below 95 KIAS).

NOTE

The landing gear may be extended below 140 KIAS to increase the rate of descent.

BEFORE LANDING

(1) Seats, *Seat* Belts, Shoulder Harnesses – ADJUST and LOCK.
(2) *Landing/Taxi Lights -- ON.*
(3) Autopilot -- OFF.
(4) ***G –*** Fuel Selector Valve -- BOTH.
(5) ***U –*** Landing Gear – DOWN (below 140 KIAS).
(6) Landing Gear – CHECK (observe main gear down and green indicator light illuminated).
(7) ***M –*** Mixture -- RICH.
(8) ***P –*** Propeller -- HIGH RPM.
(9) *Cowl Flaps -- CLOSED.*
(10) Carburetor Heat -- ON (apply full heat before closing throttle).

LANDING

NORMAL LANDING

(1) Airspeed -- 70-80 KIAS (flaps UP).
(2) Wing Flaps -- AS DESIRED (0° - 10° below 140 KIAS, 10° - 40° below 95 KIAS).
(3) Airspeed -- 65-75 KIAS (Flaps DOWN).
(4) Trim -- ADJUST.
(5) *Carburetor Heat -- ON (before closing throttle).*
(6) Touchdown -- MAIN WHEELS FIRST.
(7) Landing Roll -- LOWER NOSE WHEEL GENTLY.
(8) Braking -- MINIMUM REQUIRED.

SHORT FIELD LANDING

(1) Airspeed -- 70-80 KIAS (flaps UP) – *Normal*.
(2) Wing Flaps -- 40° (below 95 KIAS).
(3) Airspeed -- MAINTAIN 63 KIAS.
(4) Trim -- ADJUST.
(5) *Carburetor Heat -- ON (before closing throttle).*
(6) Power -- REDUCE to idle as obstacle is cleared.
(7) Touchdown -- MAIN WHEELS FIRST.
(8) Brakes -- APPLY HEAVILY – *DO NOT LOCK THE BRAKES*.
(9) Wing Flaps – RETRACT for maximum braking effectiveness.
(10) *Elevator -- FULL NOSE UP.*

SOFT FIELD LANDING

(1) *Airspeed -- 70-80 KIAS (flaps UP). – Normal.*
(2) *Cowl Flaps -- CLOSED.*
(3) *Wing Flaps -- FULL DOWN (40°).*
(4) *Airspeed -- 65-75 KIAS (flaps DOWN).*
(5) *Carburetor Heat -- ON (before closing throttle).*
(6) *Power -- 1200-1300 RPM at touchdown.*
(7) *Touchdown -- SOFTLY ON MAIN WHEELS FIRST.*
(8) *Power – IDLE.*
(9) *Rollout -- Maintain nose-high attitude with minimum weight on nose wheel.*
(10) *Brakes -- NONE unless absolutely necessary.*

BALKED LANDING

(1) Power -- FULL THROTTLE and 2400 RPM.
(2) Carburetor Heat -- COLD.
(3) Wing Flaps -- RETRACT TO 20°.
(4) Airspeed – 75 KIAS.
(5) Wing Flaps – RETRACT slowly (after reaching 75 KIAS *and clear all obstacles*).
(6) Cowl Flaps -- OPEN.

AFTER LANDING

(1) Wing Flaps -- UP.
(2) Carburetor Heat -- COLD.
(3) Cowl Flaps -- OPEN.
(4) *Strobe Lights -- OFF.*

CESSNA R182 – N736ZX NORMAL PROCEDURES

SECURING AIRPLANE

(1) Parking Brake -- SET *as required*.
(2) *Transponder -- 1200.*
(3) *Electrical Equipment -- OFF except Flashing Beacon and Navigation Lights at night.*
(4) *Auto Pilot -- OFF.*
(5) *Avionics Power Switch -- OFF.*
(6) *Throttle – IDLE 1000 to 1200 RPM.*
(7) Mixture -- IDLE CUT-OFF (pulled full out).
(8) Ignition Switch -- OFF. *Place keys on glare shield*.
(9) Master Switch -- OFF.
(10) *Electrical Switches -- ALL OFF.*
(11) Fuel Selector Valve -- RIGHT *to prevent cross feeding.*
(12) *Flight Plan -- CLOSE.*
(13) Control Lock -- INSTALL.

SERVICING AIRPLANE

(1) *Main Gear -- CHOCK.*
(2) *Grounding Wire -- CONNECT.*
(3) *Ladder – POSITION.*
(4) *Pump -- TURN ON and ZERO COUNTER.*
(5) *Refuel -- TO BOTTOM OF FILLER NECKS.*
(6) *Counter -- NOTE fuel quantity for log.*
(7) *Pump -- REPLACE HOSE and TURN-OFF PUMP.*
(8) *Grounding Wire – DISCONNECT.*
(9) *Chocks -- REMOVE.*
(10) *Tow Bar -- ATTACH.*
(11) *Airplane -- MOVE to parking spot.*

PARKING AIRPLANE

(1) *Wings and Tail -- TIE DOWN.*
(2) *Main Gear -- CHOCK.*
(3) *Control Lock – Verify INSTALLED.*
(4) *Pitot Tube Cover, Nose Plugs, and Sun Screen -- INSTALL.*
(5) *Hobbs, Tach, Fuel, and Oil -- RECORD.*
(6) *Cabin -- CLEAN.*
(7) *Flight Plan -- Verify CLOSED.*
(8) *Doors -- LOCK.*

EMERGENCY PROCEDURES

TABLE OF CONTENTS

INTRODUCTION

Pilot's Operating Handbook (POH) Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described *below* should be considered and applied as necessary to correct the problem. Emergency procedures associated with ELT and other optional systems can be found in *POH* Section 9.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:	
Wing Flaps Up	70 KIAS
Wing Flaps Down	65 KIAS
Maneuvering Speed:	
3100 lbs	112 KIAS
2550 lbs	101 KIAS
2000 lbs	89 KIAS
Maximum Glide	
3100 lbs	80 KIAS
2550 lbs	72 KIAS
2000 lbs	64 KIAS
Precautionary Landing With Engine Power	65 KIAS
Landing Without Engine Power:	
Wing Flaps Up	75 KIAS
Wing Flaps Down	65 KIAS

OPERATIONAL CHECKLISTS

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF ROLL

1. Throttle -- IDLE.
2. Brakes-- APPLY.
3. Wing Flaps -- RETRACT.
4. Mixture -- IDLE CUT OFF.
5. Ignition Switch -- OFF.
6. Master Switch -- OFF.

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

(1) Airspeed -- 70 KIAS (flaps UP).
65 KIAS (flaps DOWN).
3. Mixture -- IDLE CUT OFF.
4. Fuel Selector Valve -- OFF.
5. Ignition Switch -- OFF.
6. Wing Flaps -- AS REQUIRED (40° recommended).
7. Master Switch -- OFF.

ENGINE FAILURE DURING FLIGHT *(Restart Procedures)*

1. Airspeed -- 80 KIAS.
2. Carburetor Heat -- ON.
3. Fuel Selector Valve -- BOTH.
4. Mixture -- RICH.
5. Ignition Switch -- BOTH (or START if propeller is stopped).

NOTE

If the propeller is windmilling, the engine should restart automatically within a few seconds. If the propeller has stopped (possible at low speeds), turn the ignition switch to START, advance the throttle slowly from idle and lean the mixture from full rich as required for smooth operation.

6. Primer – IN and LOCKED.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. *Passenger Seat Backs -- MOST UPRIGHT POSITION.*
2. *Seats, Seat Belts, Shoulder Harnesses -- SECURE.*
3. Airspeed -- 70 KIAS (flaps UP).
65 KIAS (flaps DOWN).
4. Mixture -- IDLE CUT OFF.
5. Fuel Selector Valve -- OFF.
6. Ignition Switch -- OFF.
7. Landing Gear – DOWN (UP if terrain is rough or soft).
8. Wing Flaps -- AS REQUIRED (40° recommended).
9. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
10. Master Switch -- OFF when landing is assured.

NOTE

With the master switch off, wing flaps cannot be extended or retracted.

11. Touchdown -- SLIGHTLY TAIL LOW.
12. Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

1. *Passenger Seat Backs -- MOST UPRIGHT POSITION.*
2. *Seats, Seat Belts, Shoulder Harnesses -- SECURE.*
3. Airspeed -- 65 KIAS.
4. Wing Flaps -- 20°.
5. Selected Field -- *FLY* OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Electrical Switches -- OFF.
7. Landing Gear – DOWN (UP if terrain is rough or soft).
8. Wing Flaps -- 40° (on final approach).
9. Airspeed -- 65 KIAS.
10. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
11. Avionics Power Switch -- OFF.
12. Master Switch -- OFF.

NOTE

With the master switch off, wing flaps cannot be extended or retracted.

13. Touchdown -- SLIGHTLY TAIL LOW.
14. Ignition Switch -- OFF.
15. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions and SQUAWK 7700.
2. Heavy Objects (in baggage area) -- SECURE OR JETTISON.
3. *Passenger Seat Backs -- MOST UPRIGHT POSITION.*
4. *Seats, Seat Belts, Shoulder Harnesses -- SECURE.*
5. Landing Gear -- UP.
6. Flaps – 20° - 40°.
7. Power -- ESTABLISH 300 FT/MIN DESCENT AT 60 KIAS.
8. Approach -- High Winds, Heavy Seas -- INTO THE WIND.
   Light Winds, Heavy Swells -- PARALLEL TO SWELLS.

NOTE

If no power is available, approach at 70 KIAS with flaps up or at 65 KIAS with 10° flaps.

9. Cabin Doors -- UNLATCH.
10. Touchdown -- LEVEL ATTITUDE AT ESTABLISHED DESCENT.
11. Face -- CUSHION at touchdown with folded coat.
12. Airplane -- EVACUATE through cabin doors. If necessary, open windows and flood cabin to equalize pressure so that doors can be opened.
13. Life Vests and Raft -- INFLATE *WHEN CLEAR OF AIRPLANE. The aircraft cannot be depended on for flotation for more than a few minutes.*

FIRES

DURING START ON GROUND

1. Cranking -- CONTINUE, to get a start which would suck the flames and accumulated fuel through the carburetor and into the engine.

If engine starts:

2. Power -- 1700 RPM for a few minutes.
3. Engine -- SHUTDOWN and inspect for damage.

If engine fails to start:

4. Throttle -- FULL OPEN.
5. Mixture -- IDLE CUT OFF.
6. Cranking – CONTINUE.
7. Fire Extinguisher – OBTAIN (have ground attendants obtain if not installed).
8. Engine – SECURE.
   a. Master Switch -- OFF.
   b. Ignition Switch – OFF
   c. *Mixture -- IDLE CUT OFF.*
   d. Fuel Selector Valve -- OFF.
9. Fire -- EXTINGUISH using fire extinguisher, wool blanket, or dirt.
10. Fire Damage -- INSPECT. Repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. Mixture -- IDLE CUT OFF.
2. Fuel Selector Valve -- OFF.
3. Master Switch -- OFF.
4. Cabin Heat and Air -- OFF (except overhead vents).
5. Airspeed -- 100 KIAS (If fire is not extinguished, increase glide speed to find an airspeed - *within airspeed limitations* - which will provide an incombustible mixture).
6. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

1. Master Switch -- OFF.
2. Avionics Power Switch -- OFF.
3. All Other Switches (except ignition switch) -- OFF.
4. Vents/Cabin Air/Heat -- CLOSED.
5. Fire Extinguisher-- ACTIVATE.

WARNING

After discharging fire extinguisher within a closed cabin, ventilate the cabin.

6. Vents/Cabin Air/Heat -- OPEN when it is ascertained that fire is completely extinguished.

If fire appears out and electrical power is necessary for continuance of flight *to nearest suitable airport or landing area*:

7. Master Switch -- ON.
8. Circuit Breakers -- CHECK for faulty circuit, do not reset.
9. Radio Switches -- OFF.
10. Avionics Power Switch -- ON.
11. *Essential* Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localized.

CABIN FIRE

1. Master Switch -- OFF.
2. Vents/Cabin Air/Heat -- CLOSED (to avoid drafts).
3. Fire Extinguisher-- ACTIVATE.

WARNING

After discharging fire extinguisher within a closed cabin, ventilate the cabin.

4. *Vents/Cabin Air/Heat -- OPEN when it is ascertained that fire is completely extinguished.*
5. Land the airplane as soon as possible to inspect for damage.

WING FIRE

1. Navigation Light Switch -- OFF.
2. Strobe Light Switch -- OFF.
3. Pitot Heat Switch -- OFF.

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin. Land as soon as possible using flaps only as required for final approach and touchdown.

ICING

INADVERTENT ICING ENCOUNTER

1. Turn pitot heat switch ON.
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out and rotate defroster control clockwise to obtain maximum windshield defroster airflow.
4. Increase engine speed to minimize ice build-up propeller blades.
5. Watch for signs of carburetor air filter ice and apply carburetor heat as required. An unexplained loss in manifold pressure could be caused by carburetor ice or air intake filter ice. Lean the mixture if carburetor heat is used continuously.
6. Plan a landing at the nearest airport. With an extremely rapid ice buildup, select a suitable "off airport" landing site.
7. With an ice accumulation of ¼ inch or more on the wing leading edges, be prepared for significantly higher stall speed *and a longer landing roll*.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open the window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 85 to 95 KIAS depending upon the amount of the accumulation.
12. Perform a landing in level attitude.

STATIC SOURCE BLOCKAGE (Erroneous Instrument Reading Suspected)

1. Alternate Static Source Valve -- PULL ON.
2. Airspeed -- Consult appropriate table in POH Section 5.
3. Altitude -- Cruise 50 feet higher and approach 30 feet higher than normal.

LANDING GEAR MALFUNCTION PROCEDURES

LANDING GEAR FAILS TO RETRACT

1. Master Switch -- ON.
2. Landing Gear Lever -- CHECK (lever full up).
3. Landing Gear and Gear Pump Circuit Breakers -- IN.
4. Gear Up Light -- CHECK.
5. Landing Gear Lever -- RECYCLE.
6. Gear Motor -- CHECK operation (ammeter and noise).

LANDING GEAR FAILS TO EXTEND

1. Landing Gear Lever -- DOWN.
2. *Landing Gear and Gear Pump Circuit Breakers -- IN.*
3. Emergency Hand Pump -- EXTEND HANDLE, and PUMP (perpendicular to handle until resistance becomes heavy -- about 20 cycles).
4. Gear Down Light -- ON.
5. Pump Handle -- STOW.

GEAR UP LANDING

1. Landing Gear Lever -- UP.
2. Landing Gear and Gear Pump Circuit Breakers -- IN.
3. Runway -- SELECT longest hard surface or smooth sod runway available.
4. Wing Flaps -- 40° (on final approach).
5. Airspeed -- 65 KIAS.
6. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
7. Avionics Power Switch -- OFF.
8. Master Switch -- OFF when landing is assured.
9. Touchdown -- SLIGHTLY TAIL LOW.
10. Mixture -- IDLE CUT-OFF.
11. Ignition Switch -- OFF.
12. Fuel Selector Valve -- OFF.
13. Airplane -- EVACUATE.

LANDING WITHOUT POSITIVE INDICATION OF GEAR LOCKING

1. Before Landing Check -- COMPLETE.
2. Approach – NORMAL (full flaps).
3. Landing Gear and Gear Pump Circuit Breakers -- IN.
4. Landing -- TAIL LOW as smooth as possible.
5. Braking -- MINIMUM necessary.
6. Taxi -- SLOWLY.
7. Engine -- SHUTDOWN before inspecting gear.

LANDING WITH A DEFECTIVE NOSE GEAR (Or Flat Nose Tire)

1. Movable Load -- TRANSFER to baggage area.
2. Passenger -- MOVE to rear seat.
3. Before Landing Checklist -- COMPLETE.
4. Runway -- HARD SURFACE or SMOOTH SOD.
5. Flaps -- 40°.
6. Cabin Doors -- UNLATCH PRIOR TO TOUCHDOWN.
7. Avionics Power Switch -- OFF.
8. Master Switch -- OFF when landing is assured.
9. Land -- SLIGHTLY TAIL LOW.
10. Mixture -- IDLE CUT-OFF.
11. Ignition Switch -- OFF.
12. Fuel Selector Valve -- OFF.
13. Elevator Control -- HOLD NOSE OFF GROUND as long as possible.
14. Airplane – EVACUATE as soon as it stops.

LANDING WITH A FLAT MAIN TIRE

1. Approach – NORMAL (full flaps).
2. Touchdown -- GOOD MAIN TIRE FIRST, hold airplane off flat tire as long as possible with aileron control.
3. Directional Control -- MAINTAIN using brake on good wheel as required.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

AMMETER SHOWS EXCESSIVE RATE OF CHARGE (Full Scale Deflection)

1. Alternator -- OFF.
1. Nonessential Radio and Electrical Equipment -- OFF.
2. Flight -- TERMINATE as soon as practical.

LOW-VOLTAGE LIGHT ILLUMINATES DURING FLIGHT (Ammeter Indicates Discharge)

NOTE

Illumination of the low-voltage light may occur during low RPM conditions with an electrical load on the system such as during low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to de-activate the alternator system.

1. Avionics Power Switch -- OFF.
2. *Alternator Circuit Breaker -- CHECK IN.*
3. Master Switch -- OFF (both sides) *for a few seconds*.
4. Master Switch -- ON.
5. Low-Voltage Light -- CHECK OFF (*ammeter shows a positive charge).*
6. Avionics Power Switch -- ON.

If low-voltage light illuminates again:

7. Alternator -- OFF.
8. Nonessential Radio and Electrical Equipment -- OFF.
9. Flight -- TERMINATE as soon as practical.