

OPERATING CHECKLIST

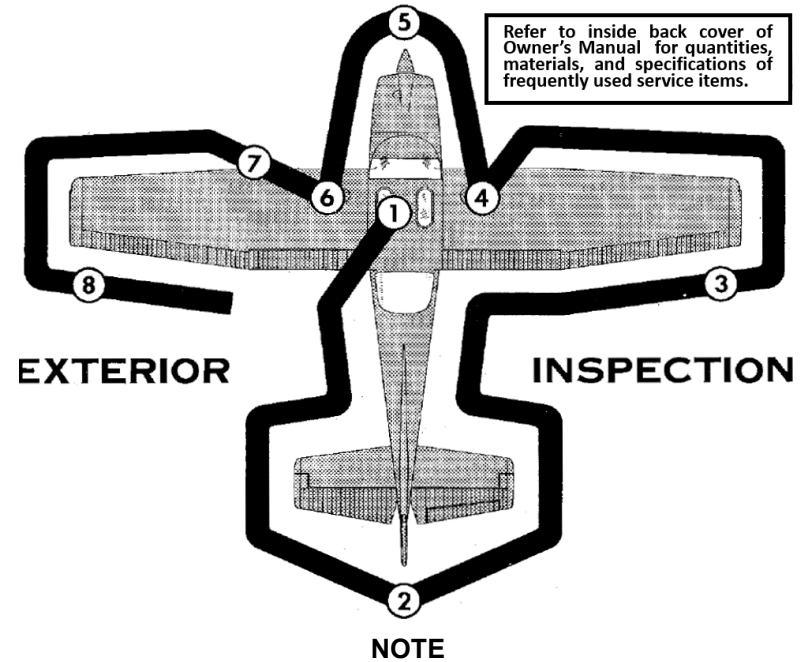
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NOTE

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



Refer to inside back cover of Owner's Manual for quantities, materials, and specifications of frequently used service items.

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

- a. Windshield -- CLEAN if required
- b. Pitot Tube Cover -- REMOVE. Check for pitot stoppage.
- c. Nose Plugs -- REMOVE. Check for air intake blockage.
- d. Documents/Hobbs/Tach -- CHECK
- e. Owner's Manual and Flyaway Notebook -- AVAILABLE IN THE AIRPLANE.
- f. Control Wheel Lock -- REMOVE.
- g. Ignition Switch -- OFF. Place keys on glare shield.
- h. Avionics Master Switch -- OFF.

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.

- i. Master Switch -- ON.
- j. Fuel Quantity Indicators -- CHECK QUANTITY.
- k. Flashing Beacon -- CHECK
- l. Interior Lights, Navigation Lights, and Landing Light -- CHECK for night operations
- m. Static Pressure Alternate Source Valve -- OFF.
- n. Fuel Selector Valve -- BOTH. Check movement RIGHT, LEFT, OFF then set to BOTH.
- o. Flaps -- EXTEND.
- p. Pitot Heat -- ON as required. (Carefully check that pitot tube is warm to touch within 30 seconds.)
- q. Pitot Heat -- OFF.
- r. Master Switch -- OFF.
- s. Elevator Trim -- SET for takeoff.
- t. Baggage Door -- CHECK, lock with key.

(2) EMPENNAGE

- a. Autopilot Static Source Opening -- CHECK for blockage (both sides).
- b. Rudder Gust Lock (if installed) -- REMOVE.
- c. Tail Tie-Down -- DISCONNECT.
- d. Control Surfaces -- CHECK freedom of movement and security.
- e. Trim Tab -- CHECK for security.

(3) RIGHT WING Trailing Edge

- a. Aileron -- CHECK freedom of movement and security.
- b. Flap -- CHECK for security and condition.

(4) RIGHT WING

- a. Wing Tie-Down -- DISCONNECT.
- b. Main Wheel Tire -- CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc...).
- c. 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.

- d. Fuel Quantity -- CHECK VISUALLY for desired level.
- e. Fuel Filler Cap -- SECURE and VENT UNOBSTRUCTED.

(5) NOSE

- a. Static Source Opening -- CHECK for stoppage (both sides).
- b. Engine Oil Dipstick -- CHECK oil level, *then check dipstick SECURE.*
Do not operate with less than nine quarts. Fill to twelve quarts for extended flight.
RAFA Procedure: If below 10 quarts – add 1 quart.
- c. 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.*
- d. Engine Cooling Air Inlets -- CLEAR of obstructions.
- e. Propeller and Spinner -- CHECK for nicks and security.
- f. Propeller Hub -- CHECK for oil leaks.
- g. Landing Lights -- CHECK for condition and cleanliness.
- h. Carburetor Air Filter -- CHECK for restrictions by dust or other foreign matter.
- i. Nose Wheel Strut and Tire -- CHECK for proper inflation of strut and general condition (weather checks, tread depth and wear, etc...) of tire.

(6) LEFT WING

- a. 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.*
- b. Fuel Quantity -- CHECK VISUALLY for desired level.
- c. Fuel Filler Cap -- SECURE and VENT UNOBSTRUCTED.
- d. Main Wheel Tire -- CHECK for proper inflation *and general condition (weather checks, tread depth and wear, etc...).*

(7) LEFT WING Leading Edge

- a. Pitot Tube Cover -- Verify REMOVED. Check pitot tube opening for stoppage.
- b. Fuel Tank Vent Opening -- CHECK for stoppage.
- c. Stall Warning Opening -- CHECK for blockage. *To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.*
- d. Wing Tie-Down -- DISCONNECT.

(8) LEFT WING Trailing Edge

- a. Aileron-- CHECK for freedom of movement and security.
- b. Flap -- CHECK for security and condition.

STARTING

PREPARE FOR STARTING

- (1) *Surrounding Area -- CHECK for personnel and hazards.
REMOVE chocks and tow bar.
MOVE aircraft to avoid propwash on parking
area/hangar if required.*
- (2) *Master Switch -- ON.*
- (3) *Avionics Switch -- ON.*
- (4) *Radios -- SET (comm and nav).*
- (5) *Weather -- CHECK (ATIS/ASOS/AWOS).*
- (6) *Avionics Master Switch -- OFF.*
- (7) *Master Switch -- OFF.*
- (8) *Passenger Briefing -- COMPLETE.*
- (9) *Flight Plan -- OPEN.*

BEFORE STARTING ENGINE

- (1) *Exterior Preflight -- COMPLETE.*
- (2) *Seats, Seat Belts, Shoulder Harness -- ADJUST and LOCK.*
- (3) *Brakes -- TEST and SET.*
- (4) *Cowl Flaps -- OPEN (move lever out of locking hole to reposition).*
- (5) *Fuel Selector Valve -- BOTH.*
- (6) *Circuit Breakers -- CHECK IN.*
- (7) *Electrical Equipment -- OFF.*
- (8) *Autopilot -- OFF.*
- (9) *Avionics Master Switch -- OFF.*

CAUTION

THE AVIONICS MASTER SWITCH MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.

STARTING ENGINE

- (1) *Mixture -- FULL RICH.*
- (2) *Carburetor Heat -- COLD.*
- (3) *Propeller -- HIGH RPM (full in).*
- (4) *Throttle -- OPEN ½ INCH.*
- (5) *Prime -- AS REQUIRED.*
- (6) *Master Switch -- ON.*
- (7) *Flashing Beacon -- ON.*
- (8) *Navigation Lights -- ON for night operations.*
- (9) *Propeller Area -- SHOUT "CLEAR PROP" and check propeller area.*
- (10) *Ignition Switch -- START (release when engine starts).*

NOTE

If engine has been over primed, start with the throttle open ¼ to ½ full open. Reduce throttle to idle when engine fires.

- (11) *Throttle -- 1000 to 1200 RPM.*
- (12) *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.

- (13) *Navigation Lights -- ON as required.*
- (14) *Avionics Master Switch -- ON.*
- (15) *Transponder -- SQUAWK 1200 ALT or ATC assigned code.*
- (16) *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 Window -- CLOSED and LOCKED.
- (4) Flight Controls -- FREE and CORRECT.
- (5) Flight Instruments -- CHECK and SET.
- (6) *Fuel Quantity -- CHECK.*
- (7) *Mixture -- FULL RICH.*
- (8) Fuel Selector Valve -- *Recheck* BOTH.
- (9) Cowl Flaps -- *Recheck* OPEN.
- (10) Throttle -- 1700 RPM.
 - a. Magnetos -- CHECK (RPM drop should not exceed 150 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 -- CHECK.
 - e. Suction -- CHECK (4.6 – 5.4 Inches Hg.).
 - f. Ammeter -- CHECK.
- (11) *Throttle -- 1000 to 1200 RPM.*
- (12) Throttle Friction Lock -- ADJUST.
- (13) Radios and Avionics -- SET (*Program GPS if needed*).
- (14) *Autopilot -- OFF.*
- (15) *Flashing Beacon and Navigation Lights -- ON as required.*
- (16) Elevator and Rudder Trim -- TAKE-OFF.
- (17) Wing Flaps -- *SET for takeoff (0°-20°).*
- (18) *Radio -- REQUEST TAKEOFF CLEARANCE or announce intentions.*
- (19) *Brakes -- RELEASE.*

TAKEOFF**NORMAL TAKE-OFF**

- (1) Wing Flaps -- 0°- 20°.
- (2) Carburetor Heat -- COLD.
- (3) Power -- FULL THROTTLE and 2600 RPM.
- (4) *Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).*
- (5) Elevator Control -- LIFT NOSE WHEEL (at 60 MPH).
- (6) Climb Speed -- 90 MPH.

MAXIMUM PERFORMANCE TAKEOFF

- (1) Wing Flaps -- 20°.
- (2) Carburetor Heat -- COLD.
- (3) Brakes -- APPLY.
- (4) Power -- FULL THROTTLE and 2600 RPM.
- (5) *Mixture -- FULL RICH (unless engine is rough).*
- (6) Brakes -- RELEASE.
- (7) Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
- (8) Climb Speed -- 60 MPH (until all obstacles are cleared).
- (9) Wing Flaps -- UP *slowly* (after reaching 80 MPH *and clear obstacles*).

SOFT FIELD TAKEOFF

- (1) *Wing Flaps -- 20°.*
- (2) *Carburetor Heat -- COLD.*
- (3) *Elevator -- FULL AFT*
- (4) *Power -- FULL THROTTLE (slowly) and 2600 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) *Wing Flaps -- UP slowly (after reaching 80 MPH and 50 feet).*

ENROUTE CLIMB**NORMAL CLIMB**

- (1) Airspeed -- 100-110 MPH.
- (2) Power -- 23 INCHES Hg. and 2450 RPM.
- (3) Fuel Selector Valve -- BOTH
- (4) Mixture -- LEAN (as required for power, temperature and smoothness).
- (5) Cowl Flaps -- OPEN (as required).

MAXIMUM PERFORMANCE CLIMB

- (1) Airspeed -- 89 MPH at sea level to 85 MPH at 10,000 feet.
- (2) Power -- FULL THROTTLE and 2600 RPM.
- (3) Fuel Selector Valve -- BOTH
- (4) Mixture -- FULL RICH (unless engine is rough).
- (5) Cowl Flaps -- FULL OPEN.

CRUISE

- (1) Power -- 15-23 INCHES Hg., 2200-2450 RPM (no more than 75%).
- (2) *Elevator and Rudder Trim -- ADJUST.*
- (3) Mixture -- LEAN.
- (4) Cowl Flaps -- CLOSED.

LET-DOWN

- (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 160 MPH,
10° - 40° below 110 MPH).

BEFORE LANDING

- (1) *Seats, Seat Belts, Shoulder Harnesses -- CHECK SECURE.*
- (2) *Landing/Taxi Lights -- ON.*
- (3) *Autopilot -- OFF.*
- (4) Fuel Selector Valve -- BOTH.
- (5) Mixture -- RICH.
- (6) Propeller -- HIGH RPM.
- (7) Cowl Flaps -- CLOSED.
- (8) Carburetor Heat -- ON (before closing throttle).
- (9) Airspeed -- 80-90 MPH (Flaps UP).
- (10) Wing Flaps -- 0°-40° (below 110 MPH).
- (11) Airspeed -- 70-80 MPH (Flaps DOWN).
- (12) *Elevator and Rudder Trim -- ADJUST.*

BALKED LANDING

- (1) Power -- FULL THROTTLE and 2600 RPM.
- (2) Carburetor Heat -- COLD.
- (3) Wing Flaps -- RETRACT TO 20°.
- (4) Airspeed -- 80 MPH.
- (5) Wing Flaps -- RETRACT slowly (*after reaching 80 MPH and clear all obstacles*).
- (6) Cowl Flaps -- OPEN.

LANDING

NORMAL LANDING

- (1) *Airspeed -- 80-90 MPH (Flaps UP).*
- (2) *Cowl Flaps -- CLOSED.*
- (3) *Wing Flaps -- 0°-40° (below 110 MPH).*
- (4) *Airspeed -- 70-80 MPH (Flaps DOWN).*
- (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 -- 80-90 MPH (flaps UP) – Normal.*
- (2) *Cowl Flaps -- CLOSED.*
- (3) *Wing Flaps -- FULL DOWN (40°).*
- (4) *Airspeed -- 69 MPH (until flare).*
- (5) *Carburetor Heat -- ON (before closing throttle).*
- (6) *Power -- REDUCE to idle after clearing obstacle.*
- (7) Touchdown -- MAIN WHEELS FIRST.
- (8) *Brakes -- APPLY HEAVILY – DO NOT LOCK THE BRAKES.*
- (9) *Wing Flaps -- RETRACT.*
- (10) *Elevator -- FULL NOSE UP (once firmly on ground).*

SOFT FIELD LANDING

- (1) *Airspeed -- 80-90 MPH (flaps UP). – Normal.*
- (2) *Cowl Flaps -- CLOSED.*
- (3) *Wing Flaps -- FULL DOWN (40°).*
- (4) *Airspeed -- 70-80 MPH (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.*

AFTER LANDING

- (1) Wing Flaps -- UP.
- (2) Carburetor Heat -- COLD.
- (3) Cowl Flaps -- OPEN.

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 Master 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 -- LEFT or RIGHT to prevent cross feeding.*
- (12) *Flight Plan -- CLOSE.*
- (13) *Control Lock -- INSTALL.*

SERVICE 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.*

PARK 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

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EMERGENCY PROCEDURES

Emergencies caused by aircraft or engine malfunctions are extremely rare if proper pre-flight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when expected weather is encountered. However, should an emergency arise the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

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 AFTER TAKEOFF

1. *Airspeed -- 80 MPH.*
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.*
8. *Cabin Door -- UNLATCH.*

ENGINE FAILURE DURING FLIGHT (Restart Procedures)

- (1) Airspeed -- 80 MPH.
- (2) Carburetor Heat -- ON.
- (3) Fuel Selector Valve -- BOTH.
- (4) Mixture -- RICH (*if restart has not occurred*).
- (5) Ignition Switch -- BOTH (or START if propeller is not windmilling).

NOTE

If the propeller is windmilling, the engine will 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 -- 80 MPH (flaps UP).
75 MPH (flaps DOWN).
- (4) Mixture -- IDLE CUT OFF.
- (5) Fuel Selector Valve -- OFF.
- (6) Ignition Switch -- OFF.
- (7) Wing Flaps -- AS REQUIRED (40° recommended).
- (8) Master Switch -- OFF (when landing is assured).

NOTE

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

- (9) Doors -- UNLATCH PRIOR TO TOUCHDOWN.
- (10) Touchdown -- SLIGHTLY TAIL LOW.
- (11) Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

- (1) *Passenger Seat Backs -- MOST UPRIGHT POSITION.*
- (2) *Seats, Seat Belts, Shoulder Harnesses -- SECURE.*
- (3) Airspeed -- 75 MPH.
- (4) Wing Flaps -- 20°.
- (5) Selected Field -- *FLY OVER*, noting the preferred area for touchdown for the next landing approach. Then retract flaps upon reaching a safe altitude and airspeed.
- (6) Avionics Master Switch and Electrical Switches -- OFF.
- (7) Wing Flaps -- 40° (on final approach).
- (8) Airspeed -- 75 MPH.
- (9) Master Switch -- OFF.

NOTE

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

- (10) Doors -- UNLATCH PRIOR TO TOUCHDOWN.
- (11) Touchdown -- SLIGHTLY TAIL LOW.
- (12) Ignition Switch -- OFF.
- (13) 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 (if possible).*
- (3) *Passenger Seat Backs -- MOST UPRIGHT POSITION.*
- (4) *Seats, Seat Belts, Shoulder Harnesses -- SECURE.*
- (5) Approach -- High Winds, Heavy Seas -- INTO THE WIND.
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
- (6) Wing Flaps -- 40°.
- (7) Power -- ESTABLISH 300 FT/MIN DESCENT AT 70 MPH.
- (8) Cabin Doors -- UNLATCH.
- (9) Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT. Avoid landing flare because of difficulty in judging aircraft height over a water surface.
- (10) Face -- CUSHION at touchdown with folded coat or cushion.
- (11) *ELT -- Activate.*
- (12) Airplane -- EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so that doors can be opened.
- (13) Life Vests and Raft (if available) -- INFLATE WHEN CLEAR OF AIRPLANE. The aircraft cannot be depended on for flotation for more than a few minutes.

FIRES

ENGINE FIRE 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 two or three minutes.
- (3) Engine -- SHUTDOWN and inspect for damage.

If engine fails to start:

- (4) Cranking – CONTINUE for two or three minutes.
- (5) Throttle -- FULL OPEN.
- (6) Fire Extinguisher – OBTAIN (have ground attendants obtain *if not installed*).

When ready to extinguish fire:

- (7) Cranking – STOP.
- (8) *Engine – SECURE.*
 - a. Master Switch -- OFF.
 - b. Ignition Switch -- OFF
 - c. *Mixture -- IDLE CUT OFF*
 - d. Fuel Selector Valve -- OFF.
- (9) Fire -- SMOTHER with fire extinguisher, seat cushion, wool blanket, or loose dirt. If practical, try to remove carburetor air filter if it is ablaze.
- (10) Fire Damage -- INSPECT THOROUGHLY. Repair damage or replace damaged components 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 MPH (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 Master 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 AND ASCERTAINING THAT FIRE HAS BEEN EXTINGUISHED, 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) *Avionics Master Switch -- ON.*
- (10) *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 AND ASCERTAINING THAT FIRE HAS BEEN EXTINGUISHED, 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) *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.

DISORIENTATION IN CLOUDS**EXECUTING A 180° TURN IN CLOUDS**

- (1) Note the time of the minute hand and observe the position of the sweep second hand on the clock.
- (2) When the sweep second hand indicates the nearest half-minute, initiate a standard rate left turn, holding the turn coordinator symbolic aircraft wing opposite the lower left index mark for 60-seconds. Then rollback to level flight by leveling the miniature aircraft.
- (3) Check accuracy of the turn by observing the compass heading which should be the reciprocal of the original heading.
- (4) If necessary, adjust heading primarily by skidding motions rather than rolling motions so that the compass will read more accurately.
- (5) Maintain altitude and airspeed by cautious application of elevator control. Avoid overcontrolling by keeping the hands off the control wheel and steering only with rudder.

EMERGENCY LET-DOWN THROUGH CLOUDS

- (1) Apply full rich mixture.
- (2) Use full carburetor heat.
- (3) Reduce power to set up a 500 to 800 ft./min. rate of descent.
- (4) Adjust the elevator trim for a stabilized descent at 90 MPH.
- (5) Keep hands off the control wheel.
- (6) Monitor turn coordinator and make corrections by rudder alone.
- (7) Adjust rudder trim to relieve unbalanced rudder force, if present.
- (8) Check trend of compass card movement and make cautious corrections with rudder to stop the turn.
- (9) Upon breaking out of clouds, resume normal cruising flight.

RECOVERY FROM A SPIRAL DIVE

- (1) Close the throttle.
- (2) Stop the turn by using coordinated aileron and rudder control to align the symbolic airplane in the coordinator with the horizon reference line.
- (3) Cautiously apply control wheel back pressure to slowly reduce the indicated airspeed to 90 MPH.
- (4) Adjust the elevator trim wheel maintain a 90 MPH glide.
- (5) Keep hands off the control wheel, using rudder control to hold a straight heading. Adjust rudder trim to relieve unbalanced rudder force, if present.
- (6) Apply carburetor heat.
- (7) Clear engine occasionally, but avoid using enough power to disturb the trimmed glide.
- (8) Upon breaking out of clouds, apply normal cruising power and resume flight.

SPINS

- (1) Retard the throttle to idle position.
- (2) Apply full rudder opposite to the direction of rotation.
- (3) After one-fourth turn, move the control wheel forward of neutral in a brisk motion.
- (4) As rotation stops, neutralize the rudder, and make a smooth recovery from the resulting dive.

ICING

FLIGHT IN ICING CONDITIONS

- (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 left 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 90 to 100 MPH 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) Altitude -- Cruise 50 feet higher and approach 30 feet higher than normal.

LANDING WITH A FLAT TIRE

LANDING WITH A FLAT MAIN TIRE

- (1) *Approach -- NORMAL.*
- (2) *Wing Flaps -- 40°.*
- (3) *Touchdown -- GOOD MAIN TIRE FIRST, hold airplane off flat tire as long as possible with aileron control.*
- (4) *Directional Control -- MAINTAIN using brake on good wheel as required.*

LANDING WITH A FLAT NOSE TIRE

- (1) *Approach -- NORMAL.*
- (2) *Flaps -- AS REQUIRED.*
- (3) *Touchdown -- ON MAINS, hold nose wheel off the ground as long as possible.*
- (4) *When nose wheel touches down, maintain full up elevator as airplane slows to stop.*

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

OVERVOLTAGE LIGHT ILLUMINATES

- (1) *Avionics Master Switch -- OFF.*
- (2) *Master Switch -- OFF (both sides) for a few seconds.*
- (3) *Master Switch -- ON.*
- (4) *Overvoltage Light -- CHECK OFF (ammeter shows normal charge).*
- (5) *Avionics Master Switch -- ON.*

If overvoltage light remains illuminated:

- (6) *Alternator -- OFF.*
- (7) *Nonessential Radio and Electrical Equipment -- OFF.*
- (8) *Flight -- TERMINATE as soon as practical.*

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 deactivate 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) *Alternator -- CHECK FOR POSITIVE CHARGE.*
- (6) *Avionics Power Switch -- ON.*

If ammeter continues to show a discharge:

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