

## **EMERGENCY PROCEDURES**

### **AIRSPEEDS FOR EMERGENCY OPERATION**

Engine Failure After Takeoff:

Wing Flaps Up . . . . 65 KIAS

Wing Flaps Down . . . . 60 KIAS

Maneuvering Speed:

2300 Lbs. . . . 97 KIAS

1950 Lbs. . . . 89 KIAS

1600 Lbs. . . . 80 KIAS

Maximum Glide:

2300 Lbs. . . . 65 KIAS

Precautionary Landing With Engine Power . . 60 KIAS

Landing Without Engine Power:

Wing Flaps Up . . . . 65 KIAS

Wing Flaps Down . . . . 60 KIAS

## **ENGINE FAILURES**

### **ENGINE FAILURE DURING TAKEOFF RUN**

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 - 65 KIAS (flaps UP)  
60 KIAS (flaps DOWN)
2. Mixture - IDLE CUT-OFF
3. Fuel Selector Valve - OFF
4. Ignition Switch - OFF
5. Wing Flaps - AS REQUIRED
6. Master Switch - OFF

### **ENGINE FAILURE DURING FLIGHT**

1. Airspeed - 65 KIAS
2. Carburetor Heat - ON
3. Fuel Selector Valve - BOTH
4. Mixture - RICH
5. Ignition Switch - BOTH (or START if propeller is stopped)
6. Primer - IN and LOCKED

## **FORCED LANDINGS**

### **EMERGENCY LANDING WITHOUT ENGINE POWER**

1. Airspeed - 65 KIAS (Flaps UP)  
60 KIAS (flaps DOWN)
2. Mixture - IDLE CUT-OFF
3. Fuel Selector Valve - OFF
4. Ignition Switch - OFF
5. Wing Flaps - AS REQUIRED (30° recommended)
6. Master Switch - OFF
7. Doors - UNLATCHED PRIOR TO TOUCHDOWN
8. Touchdown - SLIGHTLY TAIL LOW
9. Brakes - APPLY HEAVILY

### **PRECAUTIONARY LANDING WITH ENGINE POWER**

1. Wing Flaps - 20°
2. Airspeed - 60 KIAS
3. Selected Field - FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed
4. Avionics Power Switch and Electrical Switches - OFF
5. Wing Flaps - 30° (on final approach)
6. Airspeed - 60 KIAS
7. Master Switch - OFF
8. Doors - UNLATCH PRIOR TO TOUCHDOWN
9. Touchdown - SLIGHTLY TAIL LOW
10. Ignition Switch - OFF
11. Brakes - APPLY HEAVILY

## DITCHING

1. Radio - TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions
2. Heavy Objects (in baggage area) - SECURE OR JETTISON
3. Approach - High Winds, Heavy Seas - INTO THE WIND  
Light Winds, Heavy Swells - PARALLEL TO SWELLS
4. Wing Flaps - 20° to 30°
5. Power - ESTABLISH 300 FT/MIN DESCENT AT 55 KIAS

### NOTE

If no power is available, approach at 65 KIAS with flaps up or at 60 KIAS with 10° flaps

6. Cabin Doors - UNLATCH
7. Touchdown - LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT
8. Face - CUSHION at touch with folded coat
9. Airplane - EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so doors can be opened.
10. Life Vests and Raft - INFLATE

## **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
8. Engine - SECURE
  - a. Master Switch - OFF
  - b. Ignition Switch - OFF
  - c. 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 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 (if available)

### **WARNING**

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

If fire appears out and electrical equipment is necessary for continuance of flight:

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

## **CABIN FIRE**

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

### **WARNING**

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

4. Land the airplane as soon as possible to inspect for damage

## **WING FIRE**

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

### **NOTE**

Perform a sideslip to keep the flames away from the fuel tank and cabin, and 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 open defroster outlet to obtain maximum windshield defroster airflow. Adjust cabin air control to get maximum defroster heat and airflow.
4. Open the throttle to increase engine speed and minimize ice build-up on propeller blades.
5. Watch for signs of carburetor air filter ice and apply carburetor heat as required. An unexplained loss in engine speed could be caused by carburetor ice or intake filter ice. Lean the mixture for maximum RPM, if carburetor heat is used continuously.
6. Plan a Landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.
7. With an ice accumulation of  $\frac{1}{4}$  inch or more on the wing leading edges, be prepared for significantly higher stall speed.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in the wing wake airflow direction caused by wing flap extension could result in 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 65 to 75 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 calibration tables in Section 5

## **LANDING WITH A FLAT MAIN TIRE**

1. Approach - NORMAL
2. Touchdown - GOOD TIRE FIRST, hold airplane off flat tire as long as possible

## **ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS**

### **OVER-VOLTAGE LIGHT ILLUMINATES**

1. Avionics Power Switch - OFF
2. Master Switch - OFF (both sides)
3. Master Switch - ON
4. Over-Voltage Light - OFF
5. Avionics Power Switch - ON

If over-voltage light illuminates again:

6. Flight - TERMINATE as soon as possible

### **AMMETER SHOWS DISCHARGE**

1. Alternator - OFF (left side of master switch)
2. Nonessential Radio/Electrical Equipment - OFF
3. Flight - TERMINATE as soon as practical

## **NORMAL PROCEDURES**

### **SPEEDS FOR NORMAL OPERATION**

#### Takeoff, Flaps Up:

Normal Climb Out	.	.	.	.	.	70-80 KIAS
Short Field Takeoff, Flaps Up, Speed at 50 Feet	.	.	.	.	.	59 KIAS

#### Enroute Climb, Flaps Up:

Normal, Sea Level	.	.	.	.	.	75-85 KIAS
Normal, 10,000 Feet	.	.	.	.	.	70-80 KIAS
Best Rate of Climb, Sea Level	.	.	.	.	.	73 KIAS
Best Rate of Climb, 10,000 Feet	.	.	.	.	.	68 KIAS
Best Angle of Climb, Sea Level	.	.	.	.	.	59 KIAS
Best Angle of Climb, 10,000 Feet	.	.	.	.	.	61 KIAS

#### Landing Approach:

Normal Approach, Flaps Up	.	.	.	.	.	60-70 KIAS
Normal Approach, Flaps 30°	.	.	.	.	.	55-65 KIAS
Short Field Approach, Flaps 30°	.	.	.	.	.	60 KIAS

#### Balked Landing:

Maximum Power, Flaps 20°	.	.	.	.	.	55 KIAS
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#### Maximum Recommended Turbulent Air Penetration Speed:

2300 Lbs.	.	.	.	.	.	97 KIAS
1950 Lbs.	.	.	.	.	.	89 KIAS
1600 Lbs.	.	.	.	.	.	80 KIAS

#### Maximum Demonstrated Crosswind Velocity:

Takeoff or Landing	.	.	.	.	.	15 KNOTS
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## **PREFLIGHT INSPECTION**

### **Cabin:**

1. Forms Binder -
  - a. Open Discrepancies - CHECK
  - b. Weight and Balance - CHECK
  - c. Oil Change Time - NOTE
  - d. Pilot's Name - ENTER
  - e. Tach & Hobbs - CHECK
2. Airworthiness Certificate & Registration - CHECK
3. Control Wheel Lock - REMOVE
4. Ignition Switch - OFF
5. PFD (LH) and EFD (RH) Switches (center panel) - OFF
6. Master Switch – ON
7. Fuel Quantity Indicators - CHECK QUANTITY
8. Position and Landing Lights - CHECK
9. Rotating Beacon - CHECK
10. Master Switch - OFF
11. Baggage door -- OPEN, OBTAIN fuel sample cup.

### **Empennage:**

1. Fuselage - OBSERVE condition
2. Left Side Fuselage Static Port - CHECK FOR STOPPAGE
3. Left Horizontal Stabilizer - OBSERVE condition
4. Left Elevator - CHECK freedom and hinge points
5. Rudder Gust Lock - REMOVE
6. Rudder - CHECK freedom & hinge points
7. Vertical Stabilizer - CHECK condition
8. Right Elevator and Trim Tab - OBSERVE condition & hinge points
9. Right Horizontal Stabilizer - OBSERVE condition
10. Fuselage - OBSERVE condition
11. Right Side Fuselage Static Port - CHECK for stoppage
12. Upper Wing Surface - OBSERVE condition

### **Right wing trailing edge:**

1. Aileron - CHECK freedom of movement & security

### **Right wing leading edge:**

1. Nav Light and Wing Tip - OBSERVE condition, security

2. Leading Edge - CHECK condition, damage
3. Wing Tie Down - REMOVE

### **Right Main wheel and tire:**

1. Main Wheel Tire - CHECK proper inflation (38psi)
2. Brake Caliper - OBSERVE signs of fluid leakage
3. Wheel Chock - REMOVE

### **Right Wing fuel sump**

1. Before the 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.

### **Right wing fuel tank**

1. Fuel Quantity - CHECK VISUALLY
2. Fuel Filler Cap - SECURE

### **Nose:**

1. Engine Oil Level - CHECK, do not operate with less than six quarts. When departing on a XC flight of 2 hours or more and oil level is below 6.5, consideration should be given to adding a quart or, at least carrying a quart along.
2. Main Fuel Sump - 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.
3. Shimmy Dampener - CHECK for fluid leakage and security
4. Nose Strut - CHECK for proper extension (chrome showing)
5. Nose Wheel Tire - CHECK for proper inflation (45psi)
6. Nose Wheel Chock – REMOVE
7. Cowling – CHECK **ALL** fasteners
8. Cowling - REMOVE cowl plugs
9. Cylinder Area - CHECK no birds nests
10. Alternator Belt - CHECK tension
11. Propeller and Spinner - CHECK for nicks and security
12. Landing Light - CHECK for condition
13. Carburetor Air Filter - CHECK for restrictions by dust or other foreign matter
14. Static Source Opening (fwd left side of fuselage) - CHECK for stoppage

**Left main wheel and tire:**

1. Main Wheel Tire - CHECK proper inflation (38psi)
2. Brake Caliper - OBSERVE signs of fluid leakage
3. Wheel Chock - REMOVE

**Left Wing fuel sump:**

1. Before the 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.

**Left wing fuel tank:**

1. Fuel quantity - CHECK VISUALLY
2. Fuel filler cap - SECURE

**Left wing leading edge:**

1. Pitot tube cover - REMOVE & CHECK for stoppage
2. Fuel tank vent opening - CHECK for stoppage
3. Stall warning opening - CHECK for stoppage
4. Wing Tie down - REMOVE
5. Leading edge - CHECK condition, damage
6. Nav light & wing tip - OBSERVE condition, security

**Left wing trailing edge:**

1. Aileron - CHECK freedom of movement & security

**Baggage compartment - Close and lock**

**Roll aircraft forward or out of hangar:**

1. Nose tire - OBSERVE during roll for flat spots
2. Main tires - OBSERVE during roll for wear, flat spots, or cord showing
3. Towbar - REMOVE

## **BEFORE STARTING ENGINE**

1. Preflight inspection – CONFIRM COMPLETE
2. **TOWBAR - CONFIRM REMOVED/STORED**
3. Ignition Key – INSERT (Switch **OFF**)
4. Seats, Belts, Shoulder Harnesses - ADJUST and LOCK
5. Fuel Selector Valve - BOTH
6. Autopilot Power Switch – OFF
7. Avionics Master Switch - OFF
8. Circuit Breakers - CHECK IN
9. PFD & MFD Switches - OFF

## **STARTING ENGINE**

1. Master Switch - ON
2. Rotating Beacon – ON
3. Position lights (night) – ON
4. Carburetor Heat - COLD
5. Mixture - RICH
6. Ignition switch - BOTH
7. Brakes – SET or HOLD
8. Propeller area – YELL “CLEAR PROP”
9. Prime - AS REQUIRED (2 to 6 strokes; none if engine is warm)
10. Throttle - CRACKED
11. Ignition Switch - START (release when engine continues to run)
12. Oil Pressure Switch – CHECK PSI (within 30 seconds)

## **WARM UP & TAXI**

### **Prior to Taxi – Set Avionics:**

1. Avionics master - ON
2. PFD and MFD switches - ON
3. Transponder - CONFIRM code (VFR 1200)
4. Garmin 430 - ACTIVATE (press ENT)
5. Radio Frequencies – SET
6. ASOS – CHECK (Baro, Winds)
7. Altimeter - SET

### **Set-up Aspen PFD & MFD:**

1. Activate - press left or right knobs
2. Set Altimeter – press BARO key (or press Right Knob until BARO displays), dial in setting using knob
3. Set Heading Bug – to runway heading
4. Enter Flight Plan into Garmin 430
5. Select CDI navigation source (bottom center button)
6. Select Bearing Pointer Nav Sources (bottom left and right buttons)
7. Select Map Level of Detail (MAP hotkey)
8. Adjust Map Range (+) or (-)
9. Set Altitude Alerter (press Right Knob until ALT displays, dial in value)
10. Set Airspeed Bug (press Left Knob until IAS displays, dial in value)

**Autopilot:** System check (page 4-11)

### **Taxi:**

1. Announce location & intentions
2. Taxi:
  - a. Landing Light – ON
  - b. Brakes – CHECK
  - c. Turn Indicator - CHECK

### **ENGINE RUN-UP**

1. Position Aircraft - INTO WIND, nose wheel straight
2. Flight Controls - FREE and CORRECT
3. Trim – TAKEOFF, set elevator and rudder
4. Fuel Selector Valve – BOTH
5. Mixture - RICH below 3000 feet
6. Brakes - HOLD or Parking Brake Set
7. Throttle - 1700 RPM
  - a. Magnetos - CHECK (RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between magnetos)
  - b. Carburetor Heat - CHECK for RPM drop & recovery
  - c. Engine instruments and Ammeter - CHECK
  - d. Suction Gauge - CHECK
  - e. Throttle - IDLE

## TAKEOFF BRIEFING

### **Brief takeoff and action to be taken in event of engine failure.**

#### **NORMAL TAKEOFF**

1. Wing Flaps - UP
2. Brakes - HOLD
3. Power - FULL THROTTLE (2600 RPM)
4. Mixture - LEAN for field elevation per fuel flow placard
5. Brakes - RELEASE (feet low on pedals)
6. Elevator Control - LIFT NOSE WHEEL at 55 KIAS
7. **Climb Speed - 75-85 KIAS**

#### **SHORT FIELD TAKEOFF**

1. Wing Flaps - 10°
2. Brakes - HOLD
3. Power - FULL THROTTLE (2600 RPM)
4. Mixture - LEAN for field elevation per fuel flow placard
5. Brakes - RELEASE (feet low on pedals)
6. Elevator Control - MAINTAIN SLIGHTLY TAIL LOW ATTITUDE
7. Climb Speed - 60 KIAS until clear of obstacles
8. **Wing Flaps - RETRACT after clearing obstacles**

#### **PREPARE FOR TAKEOFF**

1. Proceed to HOLD SHORT LINE
2. Doors and Windows – LATCHED
3. Seat Belts – SECURE
4. Flaps – SET
5. Mixture - RICH or Set
6. Carburetor Heat – COLD
7. Autopilot – Switch OFF (for takeoff)
8. Announce intentions
9. Check Traffic - taxi into position

## **TAKEOFF**

### **RUNWAY ALIGNMENT CHECK**

1. Heading Indicator – CONFIRM runway
2. Announce Departure Intentions
3. Takeoff (as briefed)

## **ENROUTE CLIMB**

1. Airspeed - 70-85 KIAS

### **NOTE**

If a maximum performance climb is necessary, use speeds shown in the Rate of Climb chart in section 5.

2. Throttle - FULL OPEN
3. Mixture - RICH (above 3000 feet, LEAN to obtain maximum RPM)

## **CRUISE**

1. Power - 2200-2700 RPM (no more than 75% is recommended)
2. Elevator and Rudder Trim - ADJUST
3. Mixture - LEAN

## **DESCENT**

1. Mixture - ADJUST for smooth operation (full rich for idle power)
2. Power - AS DESIRED
3. Carburetor Heat - AS REQUIRED (to prevent carburetor icing)

## **BEFORE LANDING**

1. Seats, Belts, Harnesses - SECURE
2. Fuel Selector Valve - BOTH
3. Mixture - RICH
4. Carburetor Heat - ON (apply full heat before closing throttle)
5. Autopilot - OFF

## **LANDING**

### **NORMAL LANDING**

1. Airspeed - 60-70 KIAS
2. Wing Flaps - AS DESIRED (below 85 KIAS)
3. Airspeed - 55-65 KIAS (flaps down)
4. Touchdown - MAIN WHEELS FIRST
5. Landing Roll - LOWER NOSE WHEEL GENTLY
6. Braking - MINIMUM REQUIRED

### **SHORT FIELD LANDING**

1. Airspeed - 60-70 KIAS (flaps up)
2. Wing Flaps - FULL DOWN (30°)
3. Airspeed - 60 KIAS (until flare)
4. Power - REDUCE to idle after clearing obstacle
5. Touchdown - MAIN WHEELS FIRST
6. Brakes - APPLY HEAVILY
7. Wing Flaps – RETRACT

### **BALKED LANDING**

1. Throttle - FULL OPEN
2. Carburetor Heat - COLD
3. Wing Flaps - 20° (immediately)
4. Climb Speed - 55 KIAS
5. Wing Flaps - 10° (until obstacles are cleared)  
RETRACT (after reaching a safe altitude and 60 KIAS)

## **AFTER LANDING**

1. Wing Flaps - UP
2. Carburetor Heat - COLD

## ENGINE SHUTDOWN

1. Autopilot Switch, Avionics Power Switch, PFD Switch, MFD Switch - OFF
2. Magneto Grounding Check
3. Mixture - IDLE CUT-OFF (pulled full out)
4. Ignition Switch - OFF, key REMOVED
5. Lights - OFF
6. Master Switch – OFF

## REFUEL AND THRU-FLIGHT CHECKLIST

1. Annotate Flight log with fuel and oil serviced
2. Stow receipts for cross country refuel in flight bag
3. Check fuel sumps for contamination
4. Observe for signs of oil leakage
5. **Walk-around inspection - OBSERVE condition**

## POSTFLIGHT

1. Control Lock - INSTALL
2. Wheel Chocks - INSTALL (or move into hangar)
3. Tie downs - INSTALL if necessary
4. Cowl Plugs \_INSTALL
5. Pitot Cover - INSTALL
6. Forms Binder -
7. Tach & Hobbs time entered
8. Fuel and Oil - enter amount
9. Discrepancy sheet - annotated
10. Windshield - CLEAN (no bugs)
11. Keys - in flight bag
12. Credit Card - in flight bag
13. **Master Switch – OFF**
14. Hangar Lights – OFF
15. **CLOSE FLIGHT PLAN** (FSS: 1 800 922 7433)

**Autopilot check:**

1. Autopilot Power Switch – ON (RDY, ALT, ST, HD, LO TRK, TRIM UP, TRIM DN lamps illuminate then extinguish except for RDY)
2. Flight Controls – CHECK freedom of movement
3. ST mode – ENGAGE (lamp illuminates)
  - a. CHECK reduced freedom of control movement (left/right) and ability to override
  - b. L/R knob – TURN, CHECK corresponding control wheel movement
  - c. L/R knob – recenter
4. HD mode – ENGAGE (lamp illuminates)
  - a. CHECK heading bug movement using ASPEN Right Control Knob
  - b. Recenter heading bug to lubber line
5. LO – TRK mode – ENGAGE) lamp illuminates)
6. Hi -TRK mode – ENGAGE (lamp illuminates)
7. ALT HOLD mode – ENGAGE (lamp illuminates)
  - a. CHECK reduced freedom of movement forward and aft and ability to override
  - b. HOLD control wheel forward – TRIM UP illuminates
  - c. HOLD control wheel aft – TRIM UP illuminates
8. Autopilot Disconnect Switch – PRESS (RDY lamp flashes, all other lamps extinguish)
9. Flight Controls – CHECK freedom of movement
10. Heading Bug – SET to runway heading