

**ENGINE FAILURE TAKEOFF RUN**

1. THROTTLE.....IDLE
2. BRAKES.....APPLY
3. WING FLAPS.....RETRACT
4. MIXTURE.....IDLE/CUTOFF
5. IGNITION SWITCH.....OFF
5. MASTER.....OFF

**ENGINE FAILURE – IMMEDIATE AFTER TAKEOFF**

1. AIRSPEED..... 60 KIAS
2. MIXTURE.....IDLE CUT OFF
3. FUEL SHUTOFF VALVE.....OFF
4. IGNITION SWITCH.....OFF
5. WING FLAPS.....AS REQUIRED
6. MASTER SWITCH.....OFF

**ENGINE FAILURE DURING FLIGHT**

(RESTART PROCEDURES)

1. AIRSPEED.....60 KIAS
2. CARBURETOR HEAT.....ON
3. PRIMER .....IN AND LOCKED
4. FUEL SHUTOFF VALVE.....ON
5. MIXTURE .....RICH
6. IGNITION SWITCH...BOTH (or START if propeller is stopped)

**ENGINE FIRE IN FLIGHT**

1. MIXTURE.....IDLE CUT OFF
2. FUEL SHUTOFF VALVE..... OFF
3. MASTER SWITCH.....OFF
4. CABIN HEAT AND AIR.....OFF (except wing root vents)
5. AIRSPEED.....85 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. ALL SWITCHES (EXCEPT IGNITION).....OFF
3. VENTS/CABIN AIR/HEAT.....CLOSED
4. FIRE EXTINGUISHER.....(if available).....ACTIVATE

**WARNING**

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT FIRE HAS BEEN EXTINGUISHED VENTILATE THE CABIN

5. MASTER SWITCH.....ON
6. CIRCUIT BREAKERS.....CHECK for faulty circuit (do not reset)
7. RADIO/ELECTRICAL SWITCHES .. ON one at a time, With delay after each until short circuit is localized.
8. VENTS/CABIN AIR/HEAT – OPEN (when fire is out)

**CABIN FIRE**

1. MASTER SWITCH.....OFF
2. VENTS/CABIN AIR/HEAT.....CLOSED
3. FIRE EXTINGUISHER.....(if available).....ACTIVATE  
*ONCE FIRE IS OUT – VENTILATE CABIN*
4. VENTS/CABIN AIR/HEAT.....OPEN
5. LAND THE AIRPLANE AS SOON AS POSSIBLE

**ENGINE FIRE DURING START ON THE GROUND**

1. IGNITION SWITCH START - CONTINUE CRANKING to get a start which would suck the flames and accumulated fuel 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. CRANKING.....CONTINUE
5. FIRE EXTINGUISHER.....OBTAIN
6. ENGINE SECURE
  - a. MASTER SWITCH.....OFF
  - b. IGNITION SWITCH.....OFF
  - c. FUEL SHUTOFF VALVE..OFF
7. FIRE.....EXTINGUISH
8. FIRE DAMAGE.....INSPECT

**WING FIRE**

1. LANDING/TAXI LIGHT SWITCHES.....OFF
  2. NAVIGATION LIGHT SWITCH.....OFF
  3. STROBE LIGHT SWITCH.....OFF
  4. PITOT HEAT SWITCH.....OFF
- 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

**FORCED LANDING EMERGENCY****without engine power**

1. AIRSPEED....65KIAS (flaps up) 60KIAS (flaps down)
2. MIXTURE.....IDLE/CUTOFF
3. FUEL SHUTOFF VALVE.....OFF
4. IGNITION SWITCH.....OFF
5. WING FLAPS.....AS REQ.....(30° recommended)
6. MASTER SWITCH.....OFF (landing assured)
7. DOORS.....UNLATCHED (prior to landing)
8. TOUCHDOWN.....SLIGHTLY TAIL LOW
9. BRAKES.....APPLY HEAVILY

**LOW OIL PRESSURE**

1. IF A TOTAL LOSS OF OIL PRESSURE IS ACCOMPANIED BY A RISE IN OIL TEMPERATURE, THERE IS GOOD REASON TO SUSPECT AN ENGINE FAILURE IS IMMINENT.
2. REDUCE ENGINE POWER IMMEDIATELY AND SELECT A SUITABLE FORCED LANDING FIELD. USE ONLY THE MINIMUM POWER REQUIRED TO REACH THE DESIRED TOUCHDOWN SPOT

**ENGINE ROUGHNESS/LOSS OF POWER****CARBURETOR ICE**

1. FULL THROTTLE ..... APPLY
2. CARBURETOR HEAT KNOB.....PULL FULL OUT  
Until the engine runs smoothly, then
3. CARBURETOR HEAT KNOB.....PUSH FULL IN
4. READJUST THROTTLE.....AS NEEDED  
If conditions require continued carb heat in cruise flight  
Use the minimum amount necessary to prevent icing

**SPARK PLUG FOULING**

1. MIXTURE.....LEAN TO RECOMMENDED
2. MIXTURE.....RE-ADJUST FOR  
SMOOTH OPERATIONS

**GENERAL ROUGHNESS**

1. MAGNETO/STARTER....SELECT R OR L OR BOTH  
IF ROUGHNESS DISAPPEARS ON SINGLE MAGNETO,  
MONITOR POWER AND CONTINUE ON SELECTED  
MAGNETO  
SEE POH FOR POWER LOSS AND ROUGH ENGINE WARNINGS
2. THROTTLE.....REDUCE  
CHECK TO SEE IF A LESSER THROTTLE SETTING CAUSES  
ROUGHNESS TO DECREASE  
IF SEVERE ENGINE ROUGHNESS CANNOT BE ELIMINATED  
LAND AS SOON AS PRACTICABLE.

**ALTERNATOR OVERVOLTAGE****(ammeter shows overcharge)**

1. ALTERNATOR SWITCH.....OFF
2. NON-ESSENTIAL EQUIPMENT.....OFF
3. LAND AS SOON AS PRACTICABLE.

**LOW VOLTAGE**

Illumination of the low voltage (VOLTS) annunciator  
In flight

1. AVIONICS MASTER.....OFF
2. ALTERNATOR CIRCUIT BREAKER.. CHECK IN
3. MASTER SWITCH.....(both sides) OFF
4. MASTER SWITCH.....ON
5. LOW VOLTAGE ANNUNCIATOR ...CHECK OFF
6. AVIONICS MASTER.....ON

- IF VOLTS ANNUNCIATOR ILLUMINATES AGAIN
7. ALTERNATOR.....OFF
  8. NONESSENTIAL RADIO AND ELECTRICAL  
EQUIPMENT.....OFF
  9. FLIGHT..TERMINATE AS SOON AS PRACTICAL

**AIRSPEEDS**

Engine Failure after Takeoff.....	60 KIAS
Maneuvering Speed:	
1670 Lbs.....	104 KIAS
1500 Lbs.....	98 KIAS
1350 Lbs.....	93 KIAS
Max Glide (Vg).....	60 KIAS
Precautionary Landing with Engine Power....	55 KIAS
Landing Without Engine Power	
Wing Flaps Up.....	65 KIAS
Wing Flaps Down.....	60 KIAS

**NOTE – INTENTIONAL SPINS PROHIBITED**