

EMERGENCY PROCEDURES

INTRODUCTION

This section contains procedures that are recommended if an emergency condition should occur during ground operation, takeoff, or in flight. These procedures are suggested as the best course of action for coping with the particular condition described, but are not a substitute for sound judgment and common sense. Since emergencies rarely happen in modern aircraft, their occurrence is usually unexpected, and the best corrective action may not always be obvious. Pilots should familiarize themselves with the procedures given in this section and be prepared to take appropriate action should an emergency arise.

Most basic emergency procedures, such as power off landings, are a part of normal pilot training. Although these emergencies are discussed here, this information is not intended to replace such training, but only to provide a source of reference and review, and to provide information on procedures which are not the same for all aircraft. It is suggested that the pilot review standard emergency procedures periodically to remain proficient in them.

ENGINE POWER LOSS DURING TAKEOFF

The proper action to be taken if loss of power occurs during takeoff will depend on circumstances.

1. If sufficient runway remains for a normal landing, land straight ahead.
2. If insufficient runway remains, maintain a safe airspeed and make only a shallow turn if necessary to avoid obstructions. Use of flaps depends on circumstances. Normally, flaps should be fully extended for touchdown.
3. If you have gained sufficient altitude to attempt a restart, proceed as follows:
 - a. MAINTAIN SAFE AIRSPEED
 - b. FUEL SELECTOR - SWITCH TO ANOTHER TANK CONTAINING FUEL
 - c. ELECTRIC FUEL PUMP - CHECK ON
 - d. MIXTURE - CHECK RICH
 - e. CARBURETOR HEAT - ON

NOTE

If engine failure was caused by fuel exhaustion, power will not be regained after tanks are switched until empty fuel lines are filled, which may require up to ten seconds.

If power is not regained, proceed with the POWER OFF LANDING procedure.

ENGINE POWER LOSS IN FLIGHT

Complete engine power loss is usually caused by fuel flow interruption, and power will be restored shortly after fuel flow is restored. If power loss occurs at low altitude, the first step is to prepare for an emergency landing (See POWER OFF LANDING). Maintain an airspeed of at least 85 MPH, and if altitude permits, proceed as follows:

1. Fuel Selector - Switch to another tank containing fuel.
2. Electric Fuel Pump - On
3. Mixture - Rich
4. Carburetor Heat - On
5. Engine Gauges - Check for indication of the cause of power loss.
6. Primer - Check locked
7. If no fuel pressure is indicated, check tank selector position to be sure it is on a tank containing fuel.

When power is restored:

8. Carburetor Heat - Off
9. Electric Fuel Pump - Off

If the above steps do not restore power, prepare for an emergency landing.

If time permits:

1. Ignition Switch - "L" then "R" then back to "BOTH."
2. Throttle and Mixture - Different settings. (This may restore power if the problem is too rich or too lean a mixture, or partial fuel system restriction.)
3. Try another fuel tank. (Water in the fuel could take some time to be used up, and allowing the engine to windmill may restore power. If power loss is due to water, fuel pressure indications will be normal.)

NOTE

If engine failure was caused by fuel exhaustion, power will not be restored after tanks are switched until empty fuel lines are filled, which may require up to ten seconds.

If power is not restored, proceed with POWER OFF LANDING procedure.

POWER OFF LANDING

If loss of power occurs at altitude, trim the aircraft for best gliding angle 85 MPH, and look for a suitable field. If measures taken to restore power are not effective, and if time permits, check your charts for airports in the immediate vicinity; it may be possible to land at one if you have sufficient altitude. If possible, notify the FAA by radio of your difficulty and intentions. If another pilot or passenger is aboard, let them help.

When you have located a suitable field, establish a spiral pattern around this field. Try to be 1000 feet above the field at the downwind position to make a normal approach. When the field can easily be reached, slow up to 76 MPH for the shortest landing. Excess altitude may be lost by widening your pattern, using flaps or slipping, or a combination of these.

ALTERNATOR FAILURE

Loss of alternator output is detected through a zero reading on the ammeter. Before executing the following procedure, insure that the reading is zero and not merely low by actuating an electrically powered device, such as the landing light. If no increase in the ammeter reading is noted, alternator failure can be assumed.

1. Reduce electrical load.
2. Alternator Circuit Breakers - Check
3. "Alt" Switch - Off (for 1 second), then On

If the ammeter continues to indicate no output, or alternator will not stay reset, turn off "Alt" switch, maintain minimum electrical load, and land as soon as practical. All electrical power is being supplied by the battery:

ENGINE ROUGHNESS

Engine roughness is usually due to carburetor icing which is indicated by a drop in RPM, and may be accompanied by a slight loss of airspeed or altitude. If too much ice is allowed to accumulate, restoration of full power may not be possible; therefore, prompt action is required.

1. Carburetor heat - on (See Note). RPM will decrease slightly and roughness will increase. Wait for a decrease in engine roughness or an increase in RPM, indicating ice removal. If no change in approximately one minute, return carburetor heat to OFF. If the engine is still rough, try steps below.
 - a. Mixture - Adjust for maximum smoothness. Engine will run rough if too rich or too lean.
 - b. Electric Fuel Pump - On
 - c. Fuel Selector - Change to other tank to see if fuel contamination is the problem.
 - d. Engine Gauges - Check for abnormal readings. If any gauge readings are abnormal, proceed accordingly.
 - e. Magneto Switch - "L" then "R" then back to "BOTH." If operation is satisfactory on either magneto, proceed on that magneto at reduced power, with mixture full rich, to a landing at the first available airport.

If roughness persists, prepare for a precautionary landing at pilot's discretion.

NOTE

Partial carburetor heat may cause partial melting of ice which will refreeze in the intake system; therefore when using carburetor heat, always use full heat and when ice is removed return to the full cold position.

2. Connect the RED lead of the PEP kit jumper cable to the POSITIVE (+) terminal of an external 12-volt battery and the BLACK lead to the NEGATIVE (-) terminal.
3. Insert the plug of the jumper cable into the socket located on the airplane's fuselage.
4. Turn the airplane master switch ON and proceed with the normal engine starting technique.
5. After the engine has been started, turn the master switch OFF and disconnect the jumper cable plug from the airplane.
6. Turn the master switch ON and check the alternator ammeter for indication of output. DO NOT ATTEMPT FLIGHT IF THERE IS NO INDICATION OF ALTERNATOR OUTPUT.

WARM-UP

Warm-up the engine at 800 to 1200 RPM for not more than two minutes in warm weather or four minutes in cold weather. Avoid prolonged idling at low RPM as this practice may result in fouled spark plugs. If necessary to hold before takeoff, it is recommended that the engine be idled at 1200 RPM.

Takeoff may be made as soon as the ground check is completed, provided the throttle may be opened fully without backfiring or skipping and without a reduction in engine oil pressure.

GROUND CHECK

Check the magnetos at 2000 RPM by switching from BOTH to RIGHT, then back to BOTH before switching to LEFT. The drop on either magneto should not exceed 175 RPM, and each magneto should read within 50 RPM of the other. Prolonged operation on one magneto should be avoided.

Check the vacuum gauge; the indicator should read $5'' \pm .1''$ Hg at 2000 RPM.

Check both the oil temperature and pressure. The temperature may be low for some time if the engine is being run for the first time of the day, but as long as the oil pressure is within limits, the engine is ready for takeoff.

Check the annunciator panel lights with the press-to-test button*.

Carburetor heat should also be checked prior to takeoff to be sure that the control is operating properly and to clear any ice that may have formed during taxiing. Avoid prolonged operation with carburetor heat ON as the air is unfiltered. Be sure that carburetor heat is OFF for takeoff.

Operation of the engine driven fuel pump should be checked while taxiing or during preflight engine runup by switching the electric fuel pump OFF and observing the fuel pressure gauge. The electric fuel pump should be ON during takeoff to prevent loss of power during takeoff should the engine driven pump fail. The engine is warm enough for takeoff when the throttle can be fully opened without the engine faltering.

*Serial nos. 7515001 and up