

3.9h One Engine Inoperative Landing (3.5a)

Complete the Engine Securing Procedure. The landing gear should not be extended and the wing flaps should not be lowered until certain of making the field.

Maintain a normal approach keeping in mind that the landing should be made right the first time and that a go-around should be avoided if at all possible.

A final approach speed of 90 KIAS and the use of 25° rather than full wing flaps will place the airplane in the best configuration for a go-around should this be necessary.

WARNING

Under some conditions of loading and density altitude a go-around may be impossible and in any event the sudden application of power during one engine inoperative operation makes control of the airplane more difficult.

3.9i One Engine Inoperative Go-Around (Should be avoided if at all possible) (3.5a)

NOTE

A one engine inoperative go-around should be avoided if at all possible.

To execute a one engine inoperative go-around, verify the mixture and propeller levers are forward, and smoothly advance the throttle to takeoff power. Retract the flaps and landing gear. Maintain airspeed at the one engine inoperative best rate of climb speed of 88 KIAS (V_{YSE}). Set the trim and cowl flaps as required.

3.9j Summary of Factors Affecting Single Engine Operations.

Significant climb performance penalties can result from landing gear, flap, or windmilling propeller drag. These penalties are approximately as listed below:

Landing gear extended/Flaps Up	- 250 ft./min.
Flaps extended 25°/Gear Down	- 490 ft./min.
Flaps extended fully/Gear Down	- 525 ft./min.
Inoperative engine propeller windmilling (Gear and Flaps Up)	-200 ft./min.

WARNING

The propeller on the inoperative engine must be feathered, the landing gear retracted, and the wing flaps retracted for continued flight.

The following general facts should be used as a guide if an engine failure occurs:

1. **Discontinuing a takeoff upon engine failure is advisable under most circumstances. Continuing the takeoff, if engine failure occurs prior to reaching obstacle speed and gear retraction, is not advisable.**
2. Altitude is more valuable to safety after takeoff than is airspeed in excess of the best single-engine climb speed.
3. A windmilling propeller and extended landing gear cause a severe drag penalty and, therefore, **climb or continued level flight is improbable**, depending on weight, altitude and temperature. Prompt retraction of the landing gear, identification of the inoperative engine, and feathering of the propeller is of utmost importance if the takeoff is to be continued.
4. In no case should airspeed be allowed to fall below V_{XSE} (82 KIAS) unless touchdown is imminent even though altitude is lost, since any lesser speed will result in significantly reduced climb performance.

**3.9j Summary of Factors Affecting Single Engine Operations.
(Continued)**

5. If the requirement for an immediate climb is not present, allow the airplane to accelerate to the single-engine best rate-of-climb airspeed since this speed will always provide the best chance of climb or least altitude loss in a given time.
6. To maximize controllability during recovery following an engine loss near or below VMC, the airplane should be banked approximately 5° into the operative engine and the rudder used to maintain straight flight. This will result in the ball of the turn and slip indicator being displaced 1/2 to 3/4 diameter towards the operating engine.
7. To maximize climb performance after airplane is under control of the pilot and failed engine is secured, the airplane should be trimmed in a 2° to 3° bank towards the operating engine with the rudder used as needed for straight flight. This will result in approximately 1/2 ball displacement towards the operating engine. This ball displacement should be maintained during any necessary maneuvering to maintain best possible climb margins

3.11 AIR STARTING PROCEDURE (3.5b)

3.11a Unfeathering Procedure/ Unfeathering Accumulator Functioning

Move the fuel selector for the inoperative engine to the ON position and check to make sure the electric fuel pump for that engine is ON. The mixture should be set RICH. Open the throttle 1/4 inch and turn ON the magneto switches.

Push the propeller control to the full forward position. If the propeller does not windmill freely within 5 - 7 seconds after the propeller control has been moved full forward, engage the starter for 1 - 2 seconds. The throttle should be set at reduced power until the engine is warm. The alternator switch should be turned ON after restart.

NOTE

When propeller unfeathering occurs, it may be necessary to retard the prop control slightly so as to not overspeed the prop.

3.11 AIR STARTING PROCEDURE (3.5c) (Continued)**3.11b Unfeathering Procedure/ Starter Assisted**

Move the fuel selector for the inoperative engine to the ON position and check to make sure the electric fuel pump for that engine is ON. Push the propeller control forward to the cruise RPM position and the mixture should be set RICH. Push in full throttle twice and then open it 1/4 inch.

Turn ON the magneto switches and engage the starter until the propeller windmills. The throttle should be set at reduced power until the engine is warm. If the engine does not start, prime as necessary. The alternator switch should then be turned ON.

3.13 ENGINE ROUGHNESS (3.5c)

Engine roughness may be caused by induction system icing or ignition problems.

Under certain moist atmospheric conditions at temperatures of -5°C to 20°C, it is possible for ice to form in the induction system, even in summer weather. This is due to the high air velocity through the carburetor venturi and the absorption of heat from this air by vaporization of the fuel.

To avoid this, carburetor preheat is provided to replace the heat lost by vaporization. Carburetor heat should be full on when carburetor ice is encountered. Adjust mixture for maximum smoothness.

If roughness continues for more than one minute, close off all carburetor heat and adjust the mixture for maximum smoothness. The engine will run rough if the mixture is too rich or too lean. Turn ON the electric fuel pump.

Check the engine gauges for abnormal readings. If any gauge readings are abnormal proceed accordingly.

The magneto switches should then be checked one at a time. If operation is satisfactory on either magneto, proceed on that magneto at reduced power with full RICH mixture to a landing at the first available airport.

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