

# Engine Failure After Takeoff in a Single- Engine Airplane

## The Possible Turn

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**Disclaimer:** These procedures should be practiced at a safe altitude and considered only when landing straight ahead is not a viable option. If you are uncomfortable performing this maneuver, obtain advice and training from a certified flight instructor. The turnaround maneuver described here is strictly an emergency procedure. It should not be utilized unless the pilot considers it more hazardous not to perform this maneuver.

## DETERMINING MINIMUM TURNBACK ALTITUDE

To be accomplished at a safe altitude—NOT in the pattern

(for a given aircraft and configuration)

(“height” = above ground; “altitude” = read on altimeter)

1. Establish aircraft in a stabilized climb halfway between  $V_X$  and  $V_Y$  on a cardinal heading.
2. Upon reaching a safe cardinal altitude, retard throttle.
3. Do nothing for 5 seconds and hold the nose up without stalling.
4. After these 5 seconds, simultaneously roll the aircraft into a 45°-banked turn and pitch for no faster than best glide speed (or slightly slower).
5. Continue this maneuver until completing a 360-degree turn.
6. Roll out of the turn.
7. Perform a moderately aggressive flare to simulate a landing.
8. Note altitude when vertical speed becomes zero.
9. Subtract this altitude from the cardinal altitude at which the throttle was retarded.
10. The result is the altitude lost during a 360° gliding turn. This is the **OBSERVED ALTITUDE LOSS**.
11. Increase the altitude lost in a 360° maneuver by 50% to arrive at the **TURNBACK HEIGHT**.
12. Add the **TURNBACK HEIGHT** to the airport elevation to determine the minimum **TURNBACK ALTITUDE**.
13. Do not consider turning around unless 1) the aircraft has reached at least 2/3 of the **OBSERVED ALTITUDE LOSS** when passing over the departure end of the runway, and 2) it has reached at least the minimum **TURNBACK ALTITUDE**.

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# ALTITUDE LOSS WORKSHEET

For Practice at a Safe Altitude

CARDINAL ALTITUDE ..... \_\_\_\_\_

Minus ALTITUDE AT END OF MANEUVER..... - \_\_\_\_\_

Equals **OBSERVED ALTITUDE LOSS** ..... = \_\_\_\_\_

Add 50% SAFETY MARGIN ..... + \_\_\_\_\_

Equals minimum **TURNBACK HEIGHT** ..... = \_\_\_\_\_

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## TAKEOFF PLANNING WORKSHEET

OBSERVED ALTITUDE LOSS ..... \_\_\_\_\_

Multiply ..... x **2/3**

MINIMUM HEIGHT OVER END OF RUNWAY ... = \_\_\_\_\_

Add FIELD ELEVATION ..... + \_\_\_\_\_

**MINIMUM ALTITUDE OVER END OF RUNWAY =**

**(If below this altitude when crossing end of runway: DO NOT TURN BACK)**

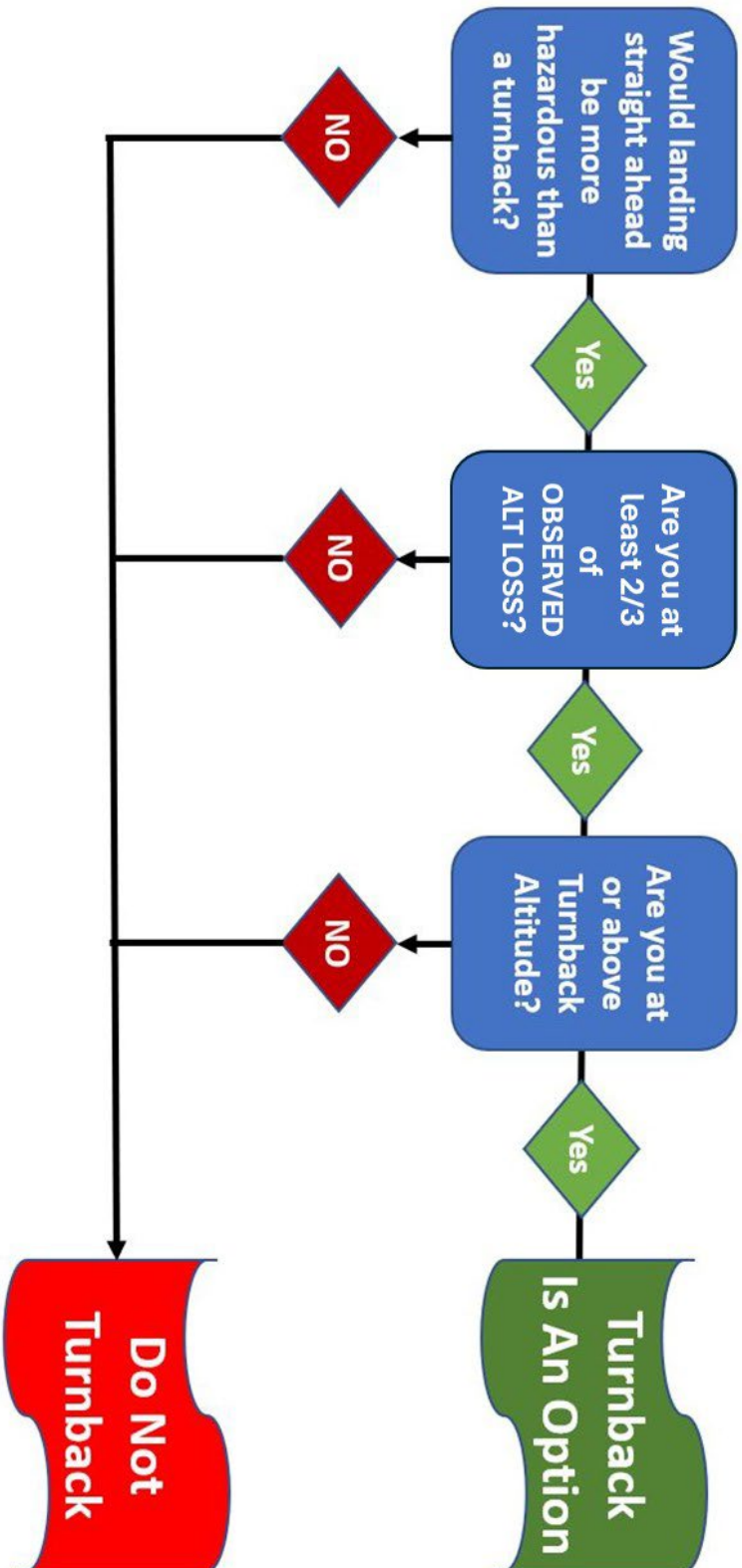
TURNBACK HEIGHT ..... = \_\_\_\_\_

Add FIELD ELEVATION ..... + \_\_\_\_\_

**MINIMUM TURNBACK ALTITUDE ..... =**

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# Turnback Flowchart



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