

Engine Failure After Takeoff in a Single- Engine Airplane

The Possible Turn

By Brian Schiff

May 15, 2019

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 the 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 TURNAROUND 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. When passing through 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 best glide speed (or slightly slower).
5. Continue this gliding turn 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 **turnaround height** without safety margin.
11. Increase the **turnaround height** by 50% to arrive at the **minimum turnaround height** with safety margin.
12. Add the **minimum turnaround height** to airport elevation to determine **minimum turnaround altitude**.
13. Do not consider turning around unless 1) the aircraft has reached at least 2/3rds of the **minimum turnaround height** when passing over the departure end of the runway –and- 2) it has reached the **minimum turnaround altitude**.

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ALTITUDE LOSS WORKSHEET

V _x	
V _y	
Median (climb speed)	

CARDINAL ALTITUDE _____
Minus SIMULATED FLARE ALTITUDE - _____
Equals ALTITUDE LOSS IN 360° TURN = _____
Add INCREASE BY 50% + _____
Equals TURNAROUND HEIGHT* = _____

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TAKEOFF PLANNING WORKSHEET

V_x	
V_y	
Median (climb speed)	

TURNAROUND HEIGHT* _____

x **2/3**

MINIMUM HEIGHT OVER END OF RUNWAY ... = _____

Add FIELD ELEVATION + _____

MINIMUM ALTITUDE OVER END OF RUNWAY...

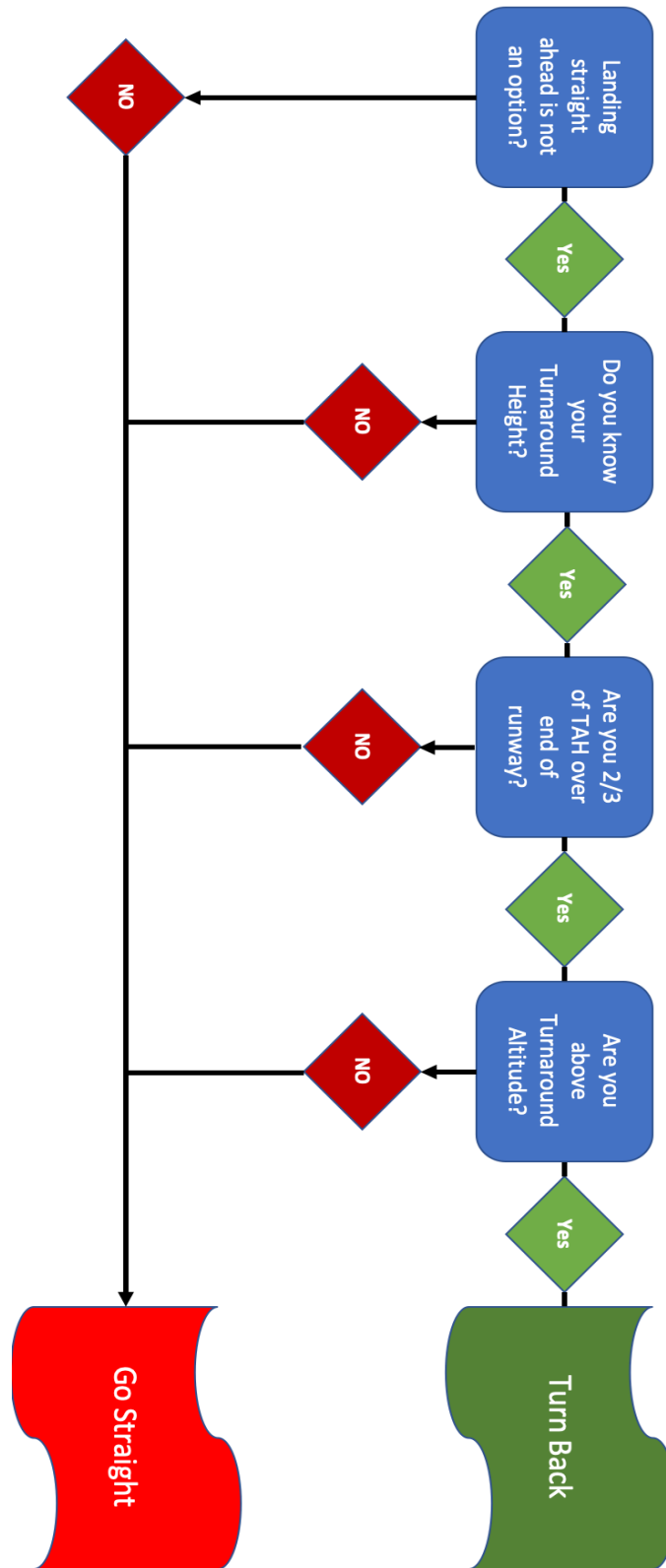
(NOTE: if below this altitude crossing end of runway: DO NOT TURN AROUND)

TURNAROUND HEIGHT* = _____

Add FIELD ELEVATION + _____

MINIMUM TURN AROUND ALTITUDE =

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