

## **GO-AROUND (GA) at LOW AIRSPEED**

The Go-around maneuver is a very important safety procedure in aviation as it can recover an airplane from the undesirable effect of an abnormal situation due any reason, whilst attempting to land an aircraft. The aircraft must have the capability to perform a satisfactory Go-around as prescribed by mandatory Law, and; the pilot must be competent enough to accomplish the maneuver successfully to avert the aircraft from arriving at an unsafe or uncontrollable situation, at any time during the approach to land.

### ***Getting back to basic aerodynamics:***

The component LIFT (**L**) generated by an airfoil depends upon the speed at which it is travelling through the air:  $L = C_L \rho^{1/2} V^2 S$

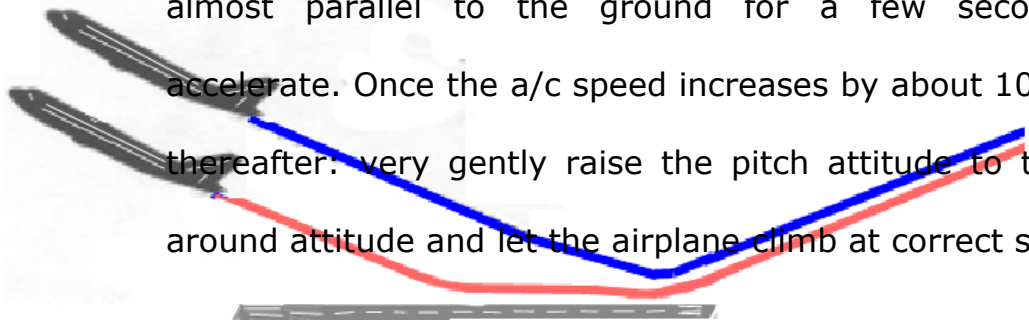
The amount of Lift which an airfoil can generate in flight pertaining to its maximum limit has relevance to a minimum airspeed which the aircraft need to have. If the speed of an airplane reduces below a certain speed, as applicable to an airplane: **Lift cannot be maintained by increasing the angle of attack** i.e. by pulling the stick back. At such low-speed, the airfoil will just act like a see-saw: i.e. the nose of the airplane will go up but the aircraft will not climb, instead the Drag will increase rapidly thereby causing the Rate-of-descent (ROD) of the airplane to increase rapidly resulting with a heavy landing or a tail-strike.

Whenever a situation arrives where a Go-around is required to terminate an approach to land at **Low-speed** when close to ground:

- a) Increase the engine power to Go-around thrust and select flaps as appropriate for the aircraft, [*in case of wind-shear maintain airplane configuration with regard to L/g & Flaps*] ;

b) maintain the present aircraft **Pitch-Attitude** and wings level if airplane is at **Low-airspeed**, thereafter;

c) as the engine power comes-in: the airplane nose would tend to pitch-up; gently ease it down so as to let the airplane fly almost parallel to the ground for a few seconds to accelerate. Once the a/c speed increases by about 10-15kts, thereafter: very gently raise the pitch attitude to the Go-around attitude and let the airplane climb at correct speed.



Select L/g up when a positive ROC is well established. In case of Wind-shear allow the airplane climb away safely until out of the wind-shear envelope before changing a/c configuration. Since such abnormal situations occur during approach to land; normally enough obstacle-free area over the airport & clearway is available ahead for the airplane to accelerate and then safely climb away, as shown (orange path). Be more practical in such odd cases when a/c speed is low especially when on single-engine, or during GA in case of an Over Weight landing-Go Around attempt. (**OWL-GA**)

Pilots must be well familiar with the airplane's OWL-GA procedure with regard to its requirements, conditions, limitations and its associated calculations. Correct ROD at touchdown is very important to prevent structure failure. Correct speed is extremely crucial to prevent over-run and also in executing a successful **GA**.

During Low-level Wind-Shear airplane speed may drop suddenly causing ROD to increase as the Lift coefficient reduces. Instant pilot action is always to pull back on the stick to reduce ROD but this would aggravate the situation causing airplane to sink faster: Increase engine Thrust to reduce sink-rate, under such situation.

## Reasons for low Speed at critical phase

1. High-flare initiated or ballooning during the process of flare initiation thereby resulting into a prolonged flare situation .
2. Wind Shear.
3. Auto-throttle/ thrust Malfunction.
4. Manual throttle/thrust operation. Un-monitored air-speed.
5. Engine failure/ reverser unlocked
6. Technical malfunction.

Bear these points in mind whenever you come in to land especially when wind-shear activity is reported. Airplane capability must be sufficient enough to execute a safe Go-around at about flare height. Even if the wheels hit the ground, the airplane will yet be able to climb away safely soon with the GA procedure. Modern airline jets are designed to withstand structural 'g' loads upon its Landing-gears upto a ROD of about 1200 f.p.m. during landings.

Many airplane accidents & incidents have occurred during this critical phase of flight due to unsuccessful Go-around execution. Airplane speed & height above ground are two main factors essential for safe execution of a Go-Around maneuver besides having pilot skill & good airmanship.

*Good judgment & Split-second correct decisions makes a good professional pilot. If a pilot has landed safely thousands of times earlier; it does not ensure a safe-one for the next approach to land. Anticipation & complacency factors need be reviewed humbly. Lot of contemplation and repetitive thinking is required for the mind to deliver the corrective thought at the correct time of need. Do not get hypnotized. The human mind is a wonderful tool available for purposeful applications. Get better grips about the same at [www.divinekripa.in](http://www.divinekripa.in)*

Also read about 'Avoidance of Tail-strike during landing' article, in the Aviation section at this site to understand the aerodynamic characteristics of Jet liners.