

Crosswind Takeoff©

The crosswind takeoff requires some timing skills that are not present in other landings. On full power application the yoke is held full over into the wind but not back as in normal conditions. The intention is to hold the up-wind wheel on the ground while remaining firmly enough on the ground to prevent any sideways skipping of the aircraft. As the ailerons become effective only enough is used to prevent side movement.

Once the speed reaches within five knots of your normal rotation speed a combined series of events should occur. The yoke is leveled and moved relatively abruptly to 'pop' the aircraft off the runway. Once off the runway the plane is held into ground effect and crabbed into the wind with rudder application. The intention is to allow the plane to accelerate quickly while maintaining runway alignment. Unlike the landing, no effort is made to keep the aircraft parallel to the runway centerline.

Crosswind Landing

To begin with we must assume that the student pilot has flown the pattern in such a manner as to arrive on the final approach with appropriate flaps for wind angle and velocity, on glide slope, and on airspeed.

The basic training exercise for the crosswind landing is the Dutch roll. The presumption is that mastery of the Dutch roll has prepared the pilot to keep the aircraft parallel to the runway at all times on final, while maintaining runway alignment with left-right side slips as required. My preference is to maintain a constant airspeed regardless of the slip. This means that the greater the slip the greater the forward yoke pressure.

In the ideal approach the wind would remain as a constant. This would mean that the slip angle and required rudder would remain constant. It doesn't happen. The wind is a constantly changing approach factor both as to angle and velocity. This means that the pilot must constantly adjust aileron, rudder, and yoke to maintain a stabilized approach with constant heading, runway alignment and airspeed. The essential skill is the previously mentioned Dutch roll and anticipation of changing conditions before radical adjustments are required. I very much recommend that extended straight in approaches as a planned training exercise to give smoothness to the control applications.

The wind velocity usually decreases during the descent so that less cross control application is required as the flare approaches. The actual flare is much as with any other landing but since generally less than full flaps will be applied greater care must be used to avoid ballooning. At this point full attention must be paid to prevent any sideways movement of the aircraft. Landing gear are exceptionally strong and resilient but they are most subject to damage when side loads are applied.

If everything goes well the touchdown is made at minimum speed on the upwind main wheel with the nose wheel and downwind main still flying. This configuration can be bothersome to passengers and should be explained as normal before the landing. The wing low need not be of concern if the aircraft is kept going parallel to the runway center line. As the aircraft decelerates the yoke should be held ever more into the wind and back. The downwind tire will touch to be followed

by the nose wheel. Use rudder as required to hold a straight course down the runway after the first touchdown. Correctly done you are now in the proper configuration for taxiing on the runway.

Other Opinions:

Crosswind Takeoff

Opinion

The rate of (aileron) reduction depends on the absolute magnitude of the crosswind component and the developing forward speed.

Opinion

I have a different viewpoint. I do not want anyone that I have taught to arrive at a destination with crosswinds that they have not been exposed to.

Opinion

My suggestion to you is to get with your instructor on the windiest day you can and practice x-wind takeoffs and landings to determine what your maximum capability may be.

Crosswind Landing

Opinion

There are two distinct techniques used:

1. Keeping the longitudinal axis of the aircraft aligned with the centerline of the runway and maintaining a certain bank-angle to compensate for the crosswind; and
2. Maintaining a crab angle on approach, and applying some rudder just before touchdown to get the aircraft aligned with the runway.

Opinion

Technique #2 actually consists of crabbing into the wind and remaining coordinated for most of the final approach and then converting to technique #1 just prior to touchdown. The trick is in judging just how much slip is required to eliminate any sideways motion at touchdown.

Opinion

Practice makes perfect, but don't get in over your head. Start with a modest, steady crosswind and work up as you become proficient. Don't practice alone, make sure your instructor is there to give advice and keep you out of trouble.

Opinion

Sometimes the simplest explanations are the best.

From a former instructor:

Use the ailerons to compensate for drift away from the centerline, and the rudder to keep yourself aligned parallel to the runway. With this in mind, you'll be using the controls automatically to compensate without realizing it. Like driving a car; do you consciously think of how much pressure to apply to the brakes to stop in a certain manner, or how far to turn the wheel to turn into another street? Probably not; you just do "whatever it takes". Of course the landing/driving analogy breaks down when one considers that you can always see which way the road will go when driving, but you can only react to gusts when landing. But that makes it fun.

Opinion

Put aileron into the wind with opposite rudder during the final approach. If strong winds are present then use a no-flap or partial flap approach. It's that simple. Don't make it more complicated than it is.

Opinion

Wish I could have made it that simple and easy for the students I have taught over the past thirty years. Seems that students have trouble with all the variables of airspeed, wind velocity, bank angle and rudder application. Of all standard flight maneuvers the crosswind landing requires the greatest variety of contradictory control applications.

Opinion

The trick is to separate in your mind the function of the controls. Once you turn on finally, the rudder has one purpose - keeping the nose aligned parallel with the runway, regardless of the position of the runway centerline. The ailerons have just one job, maintaining position over the centerline.

Opinion

Every aircraft is certified as having a demonstrated crosswind capability. This is determined by the winds available at the time of certification. An average pilot should be capable of landing in such conditions. As crosswinds exceed this demonstrated minimum a pilot should minimize flaps and increase approach speed. The maximum aircraft capability is exceeded when full control input is not capable of maintaining directional control even at increased speeds.