The Case Against Touch and Go Landings

For almost as long as there have been airplanes, pilots have used the touch and go landing as a method of squeezing in as many takeoffs and landings into one hour of flight training as possible. There was even a time in my career as a flight instructor that I used the mighty touch and go as a training tool. My support for the touch and go recently came to an end, when I made my mind up once and for all that the I would forever remove the practice of teaching touch and go landings from my bag of instructor tricks, or at least, severely limit the times that I let it out of the bag! Here's why.

The takeoff roll is a high work load environment, and during this phase of flight, a lot of things have to happen in a specific order, at specific times, at predetermined speeds and power settings in order for it to be done properly and safely. Think about the way we perform takeoffs at SkySchool… we perform them *procedurally*. We brief the takeoff, establish a plan of action should things go a bit crooked, discuss speeds for Vr and, Vx or Vy as appropriate. Discuss our abort criteria, and the ever-critical action plan in the event that we suffer a catastrophic failure on the climb from the runway. Generally speaking, we are stopped, holding short of the runway, brakes applied, content in an easily controlled environment when we do this. It is not until we have conducted an appropriate checklist, lined up on the runway and applied power that we begin the process of alighting into the air. Even then… *we are still procedural*. "Engine Instruments Green" we confidently announce, with our eyes scanning across the oil pressure, fuel pressure etc. and with the first jostling of the airspeed indicator needle our routine continues…"Airspeed Alive" and from there, we hope, the takeoff continues normally. We lift the nose into a slight wheelie at 60 miles per hour, instinctively depressing the right rudder pedal ever so slightly to counter the turning tendencies that come with every nose high attitude. The rumble of the wheels against the asphalt ceases, we cast aside the ties which bind us to the ground as we pitch for 85, one hand firmly rested on the throttle ensuring it doesn't creep back and cost us precious engine RPM.

That's how you're doing it… *right*?

Good! Now we have entered the climb mode of which we have two climb options; Vx and Vy. Vx offers us a steep obstacle clearance climb, while Vy allows us a greater forward distance traveled for a given gain in altitude. Anything slower, we risk stalling the airplane, and anything faster, we aren't putting air between our seat cushions and the ground quickly enough. If the problem with climbing out at 100 or 105 miles per hour escapes you, lets have a look at this problem in a bit of detail.

By climbing at "Vy plus 20" (aka 105 miles per hour) we have reduced our *rate of climb* by a few hundred feet per minute. To the uneducated… this seems like better stall protection. Its not. Fundamentally… its suicide. Why? When you climb the airplane at a higher indicated airspeed you rob yourself of "down range altitude". Take two identical airplanes for example. They start their takeoff roll at the same point, same power setting, same configuration, and atmospheric conditions. "Airplane A" climbs at the published Vy of 85 mph. "Airplane B" climbs at "Vy plus

20". When both airplanes reach the departure end of the runway, "Airplane A" will *always* be several hundred feet higher above the ground than "airplane B" – cut engine power to both aircraft at the same exact moment. The pilot of "Airplane A" has altitude, and altitude means options. The pilot of "Airplane A" is packing the heat needed to win the battle against both time and gravity. The pilot of "Airplane B" is already in the trees before the "Sully Factor" (aka reaction time) has even had a few seconds to kick in.

There is a phrase in aviation you should take to heart. **"When you takeoff… there are few things as worthless as runway behind you"** – lets take those two identical airplanes again and depart "Airplane A" from the threshold, while we start the roll for "Airplane B" from midfield. This time, we are going to pilot them both *perfectly*. Well sadly, perfect technique won't make any difference in the event that we fail the engines above the departure end of the field because invariably "Airplane B" is going to be down in the weeds while "Airplane A" is passing about 700 feet AGL!

In essence, every time we perform a touch and go… we force our selves to be "Airplane B" and without a gob of fortuitous circumstance and blind luck, "Airplane B" will never win this the altitude war. It just won't. No matter how well you fly "Airplane B" physics wins the argument.

Compounding the issue of the takeoff phase of flight being a high workload environment, during a touch and go, while rolling down the runway at 50-60 mph, you are now forcing yourself to go "heads-down" while you reconfigure trim, reset flaps, work to maintain centerline, watch for obstacles which may have appeared on the runway (deer, hogs, dogs, airport vehicles, other airplanes etc.) and you break the cardinal rule of aviation.

What's the cardinal rule of aviation? You ask… "Aviate, Navigate, Communicate" – in simplified terms, it means fly the airplane first, navigate second, and communicate last. This cardinal rule applies to normal operations just the same as it does emergencies, or unusual situations.

By doing a touch and go, you force yourself to transition from the high drag, low speed, nose up trimmed descent environment of final approach – to the low drag, low speed, neutral trim, climb environment associated with departure. Not only are you forced to make this transition on the move, you are forced to make it *quickly*. This brings us to another term in aviation I want you to take to heart… "**task saturation"**. In a nutshell task saturation in the aeronautical sense, means that the pilot has a large number of attention divisors, which must be confronted in a short time frame, often without the resources, time, crew support or tools to complete the necessary elements of the task. It is also a word that appears in an alarmingly large percentage of fatality accident reports.

In over twenty years instructing pilots of various skill levels, how many times do you think I have witnessed a touch and go aircraft depart with full flaps? How about with the flaps set correctly but the trim set full nose up? How about with the flaps and trim set correctly, but with the power 200 or 300 RPM too low? How many times do you think I have seen a student lose directional control of the aircraft while they were heads down adjusting trim and flaps? How many of those circumstances lead to damage to the airplane, airport equipment, injury, or death.

Is one time enough?

If touch and go landings have their place in aviation, that place is a long, wide runway located at a reduced traffic airport, in an environment where there are plenty of off airport landing options, little or no crosswinds, no obstacles, and we have plenty of time to slow down, think, plan ahead, collect ourselves and launch into the clear blue once more. My assumption is that such airports exist… but only in places like Oz, Narnia, Middle Earth and other such fantasy lands.