

IX.A. Steep Turns

About: Steep turns consist of multiple 360 to 720 degree turns in either or both direction using a bank angle between 45 and 60 degrees.

TSW: Develop skill in control smoothness and coordination, awareness to outside references, and division of attention.

How: This is shown by 2x 360 degree turns in opposite directions +/-100ft and rolling out +/-10 degrees.

Procedure:

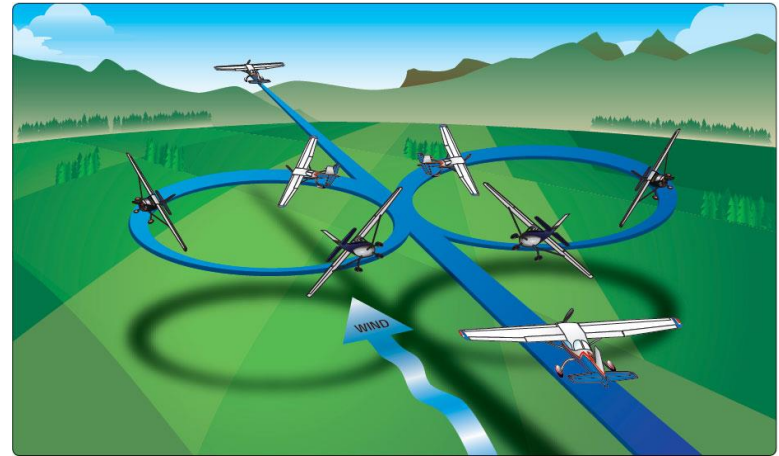
1. No lower than 1500 AGL
2. Two 90 degree clearing turns
3. Establish V_A or the recommended entry speed
4. Roll into 45-50 degree bank. (Private/Commercial)
5. Add power (200rpm to full) when fully in bank.
6. Maintain altitude
7. Roll out $\frac{1}{2}$ bank angle prior to entry heading
8. Remove added power and level off
9. Roll in opposite direction, add power
10. Roll out $\frac{1}{2}$ bank angle prior to entry heading

Discussion Points:

1. Trim for level flight prior to maneuver.
2. Select a heading (cardinal directions) and outside reference point
3. From straight-and-level flight, coordinate the aileron and rudder **pressure** to roll into turn. Make it brisk and coordinated. Do not be slow rolling into the turn. Add power once established in turn.
 - a. **Adverse Yaw:** down wing less lift than raised wing (rudder)
 - b. **Torque effect:** More rudder for right turns than left turns
4. Vertical component of lift decreases in a turn. Maintain altitude with back pressure. (If too steep, decrease bank for a moment)
 - a. **Overbanking tendency:** Outside wing is traveling faster than inside wing. Outside wing develops more lift and drag. Apply opposite aileron to correct.
5. Look outside (sight picture/ constant angle to horizon), peak inside (Altimeter/ VSI).

Evaluations/ Standards:

11. Establish V_A or the recommended entry speed for the airplane.
12. Standards – Roll into a 45 bank (Private) 50 bank (Commercial)
 - a. Maintain the entry altitude ± 100 feet, airspeed ± 10 knots, bank $\pm 5^\circ$, and roll out on the entry heading $\pm 10^\circ$.



Common errors:

- Failure to adequately clear the area
- Excessive pitch change during entry or recovery
- Attempts to start recovery too early or too late
- Failure to stop the turn on a precise heading
- Excessive rudder during recovery, resulting in skidding
- Inadequate power management
- Inadequate airspeed control
- Poor coordination
- Gaining altitude in right turns and/or losing altitude in left turns.
- Failure to maintain constant bank angle
- Disorientation
- Attempting to perform the maneuver by instrument reference rather than visual reference.
- Failure to scan for other traffic during the maneuver.