AVIATION QUARTERLY

Room To Manoeuvre

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Emergency Manoeuvres Training

Wake turbulence from the airplane ahead flips you inverted on approach! What will you do:

a) pull back on the yoke,

b) apply aileron, or

c) fall out?

The Cold, Cruel World

Fall out? Choice ‘c’ is clearly a red herring! Surely pilots fly with straps secured at all times. Perhaps, but the vast majority of pilots, amateur and professional alike, have never been upside down in an airplane.

Just imagine yourself in this situation. One minute the airspeed is bang on target, the airplane is on a perfect glide slope, life is good. The next minute you’re hanging from the straps, head below feet for the first time since the monkey bars in elementary school. Pencils, charts and the Canada Flight Supplement are heading for the ceiling. Mother Earth fills the windshield. Life is suddenly much more complicated!

Now! Quickly! Choose ‘a’ or ‘b’! Most pilots confronted with a face full of earth choose ‘a’, pull back on the controls. After all, that’s how we’re taught to recover from dives.

The problem is that from inverted the nose has to travel a long way to get the sky on top again. While completing the required half loop the airplane is rapidly shedding altitude and acquiring speed. The ground rushes up, the pilot’s legs stiffen on the rudder pedals to push it away. The upper body leans back to avoid the impact. The grip on the yoke tightens, the pull increases.

The outcome is generally ugly, the details depending on your altitude when the nightmare starts. Given enough height the airplane will probably exceed Vne and, carrying a lot of Gs, will disassemble and hit the ground in several pieces. From a lower starting point there won’t be room to complete the half loop and the airplane will hit the ground in one piece.

If by some miracle the airplane doesn’t dent the ground, the discombobulated pilot still has to pull together enough of the right stuff to get the airplane onto a runway.

Rolling upsets as they are sometimes called have happened to everything from light aircraft to multiengine jets. Answer ‘a’ is wrong for all.

The correct answer is ‘b’. Roll back to upright and lose minimal altitude in the process. Which direction to roll? Once the roll has developed momentum it is usually best to continue in the same direction. However, a pilot who understands the power of full aileron deflection and identifies the uncommanded roll early enough may stop it before momentum builds.

The aerobatic pilot, familiar with the technique for slow rolls, may add a forward shove on the column while inverted and some top rudder going through knife edge and lose no altitude at all! Whatever, ‘b’ is the only way out.

“But,” you say, “I’m a recreational pilot who never ventures near airports frequented by heavy iron. That can’t happen to me!” Well every recreational flight ends with a landing. Let’s say there’s a quartering tailwind on base leg, for example in a left hand pattern when the runway has a crosswind from the left.

You’re distracted by traffic and start the turn to final a bit late, holding back pressure to compensate for being a little low this far out. The airspeed is less than ideal. The airplane is overshooting the extended runway centerline. You don’t want to increase the bank so near the ground.

Add some rudder to skid it around, put in some opposite aileron to avoid getting too steep. Not quite enough, add some more rudder. Wham! A spin! Now what?

Conventional Pilot Training

The common thread in these two scenarios is that conventional training does not prepare a pilot for such situations. The focus is on preparing the student, whether beginner or advanced, to pass the flight test. Bank angles don’t exceed 60 degrees, pitch angles rarely if ever hit 30 degrees, the aircraft is never inverted. This does not necessarily prepare one for all the eventualities of the real world.

In conventional training stalls are entered from straight and level flight. Power is reduced and the yoke is moved

progressively backwards to maintain altitude while airspeed decays. When the nose drops the student releases back pressure, applies power and levels off. For spin training the student stalls as just described then enters the spin by adding rudder. For recovery the drill is to use the foot opposite to that used to enter the spin.

When was the last time the media reported that an aircraft stalled and spun from straight and level cruise at 5,000 feet?

Most aircraft used in conventional training are not certified for the manoeuvres necessary to demonstrate and practise the entry and recovery from such situations. Students read a few paragraphs in a text book, the instructor adds some words of embellishment and the rest is left to the imagination.

Emergency Manoeuvres Training

Emergency Manoeuvres Training, EMT, has evolved relatively recently to fill this gap. The fundamental objective of EMT is to extend the pilot's proficiency to include emergency situations which might reasonably be encountered in the real world.

The pilot will acquire the situational awareness and handling skills to retain control of the aircraft outside the flight envelope of normal operations. At the altitudes where these emergencies typically occur an immediate, instinctive response is required for survival.

EMT goes beyond the recovery techniques taught in unusual attitude and spin training programs by examining what creates the emergency in the first place. In many respects it is this aspect of EMT which is most valuable. If a high degree of sensitivity to the early warning signals can be instilled then the pilot will intuitively avoid the crisis.

It is not possible to impart these recognition and recovery skills without realistic demonstration and practise in real airplanes. Simulators, no matter how sophisticated, cannot reproduce the visual and physical sensations encountered on excursions from the average flight regime. These sensations can be so overpowering to the uninitiated that all useful action is precluded.

The core curriculum of a quality EMT offering will include rolling upsets from wake turbulence encounters as well as a complete series of stalls and spins. Departure, arrival and overshoot configurations will be covered, including climbing and descending turns. More comprehensive courses may include control failure scenarios, such as unresponsive elevators, and engine failures. To the greatest degree feasible the pilot should be able to say: "Been there, done that!"

Pilots, like sailors on the ocean, must be self-sufficient. There is no pulling off to the side of the road and calling CAA on the cell phone. Freezing or panicking in an emergency guarantees disaster. That's why we think ahead, have action plans ready and practise their use.

All pilots - recreational, business or professional - are exposed to the risks that Emergency Manoeuvres Training programs address. For the truly complete pilot, no attitude should be unusual, no situation unforeseen.