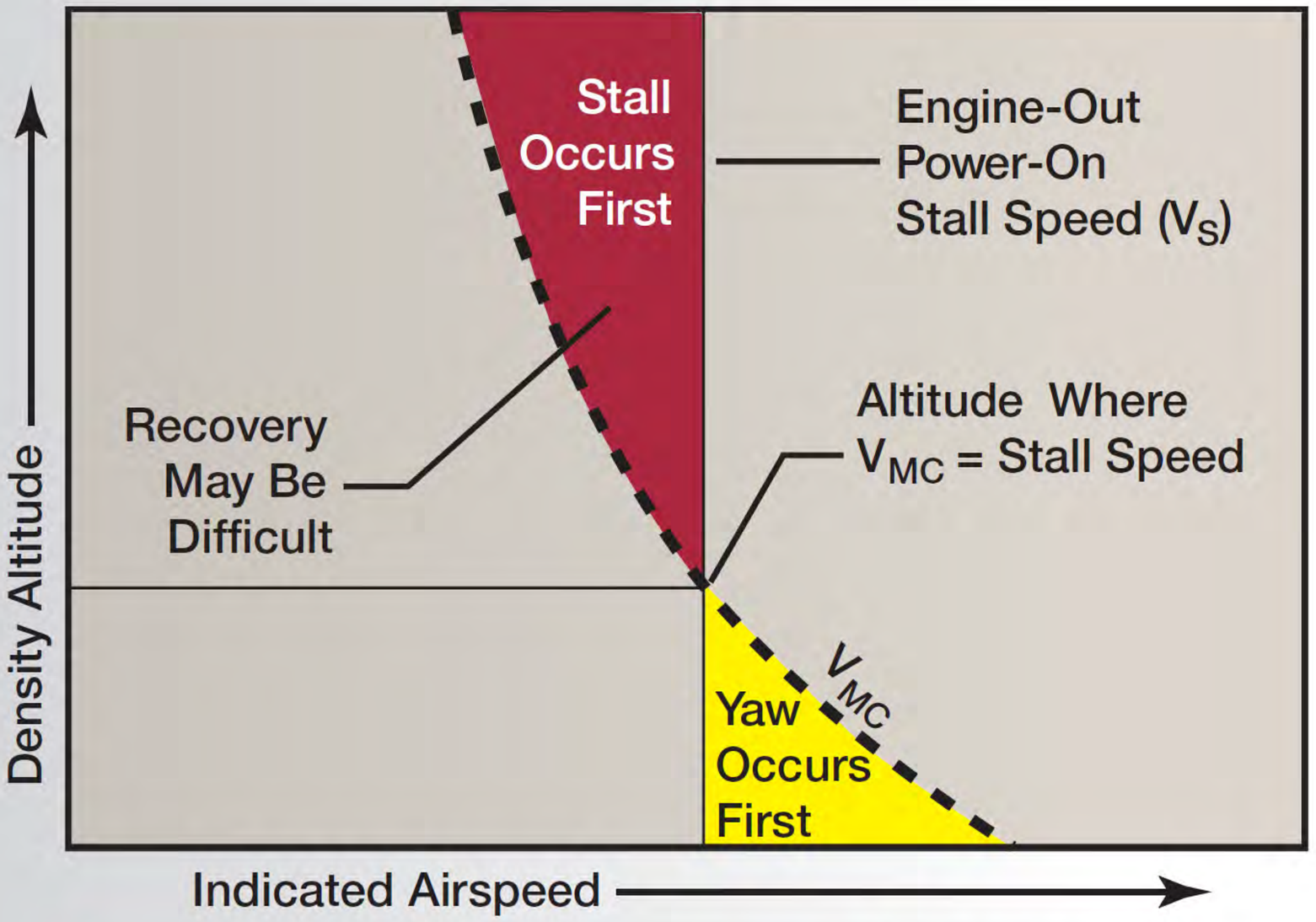
The V_{MC} Demonstration

Pilots spend most of their time demonstrating they're in control. When flying a multiengine airplane, however, they also need to know how to lose control. Specifically, the practical test standards (PTS) call for the applicant to demonstrate loss of directional control, or V_{MC}, the minimum airspeed at which directional control can be maintained.



According to the FAA's Commercial Pilot practical test standards, "[a]irplanes with normally aspirated engines will lose power as altitude increases because of the reduced density of the air entering the induction system of the engine. This loss of power will result in a V_{MC} lower than the stall speed at higher altitudes. Therefore, recovery should be made at the first indication of loss of directional control, stall warning, or buffet." The chart above shows why.

One of the main concepts of the V_{MC} demonstration is understanding the airspeed at which directional control is lost when operating on one engine is not fixed. Even though it's usually marked on a twin's airspeed indicator as a red radial line, it changes with density altitude and bank angle, among other variables. Specifically, V_{MC} decreases as density altitude increases. Eventually, it will decrease to or below the airplane's stalling speed. The relationship is pictured in the graphic above.

At the same time, some airplanes' V_{MC} may be below V_S, in which case the FAA recommends artificially limiting rudder authority during the demonstration. In no case should the V_{MC} demonstration proceed to a stall. The result likely will include a violent entry and may be unrecoverable.

The V_{MC} demonstration should be entered into from level flight, with the "failed" engine already simulated by approximating zero thrust or shut down and feathered. In no situation should the maneuver be entered by pitching up to a high angle with both engines operating and then reducing power on the critical engine. As the FAA's Commercial Pilot-Airplane PTS states, "This technique is hazardous and may result in loss of airplane control."