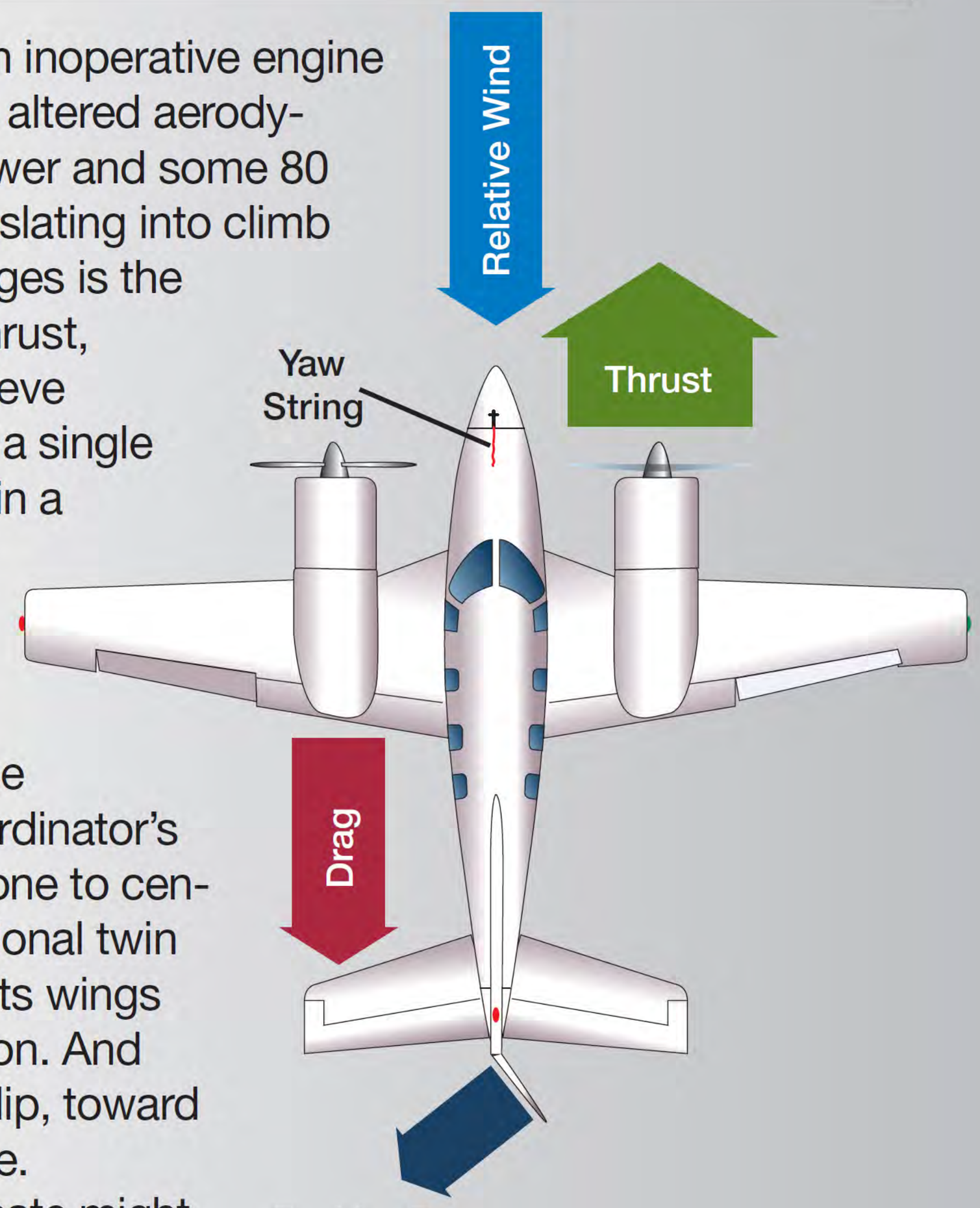
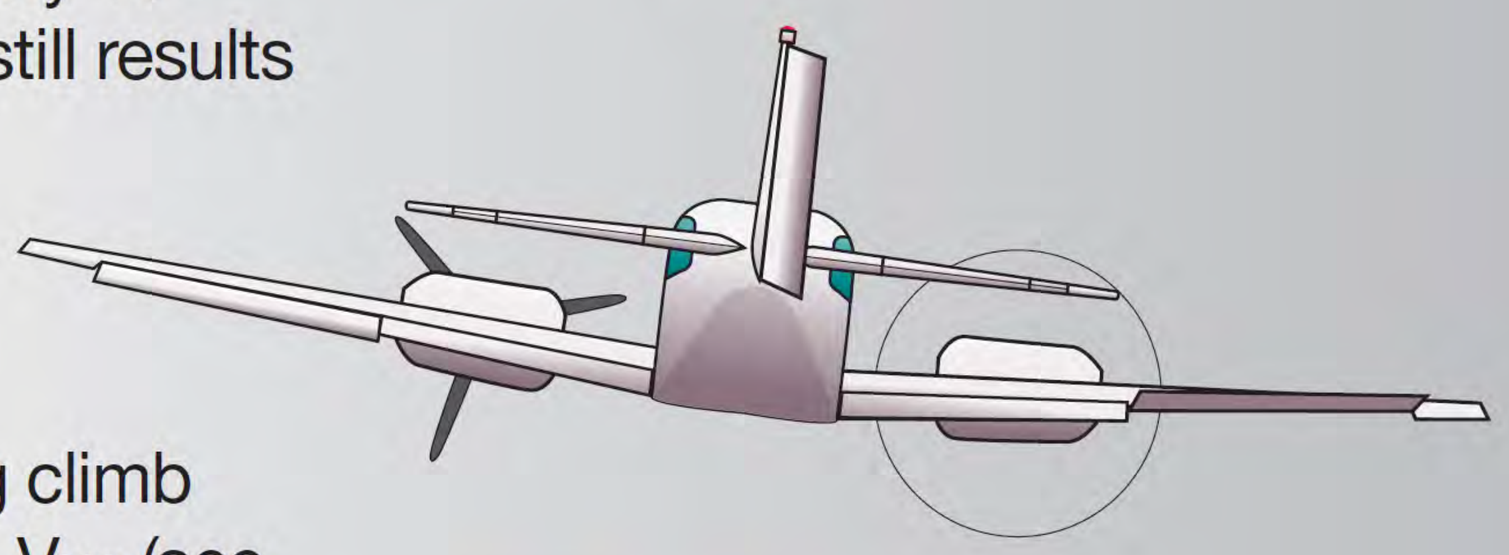
Raising The Dead

Flying a conventional twin with an inoperative engine means coping with the airplane's altered aerodynamics, losing half your horsepower and some 80 percent of the excess power translating into climb capability. Chief among the changes is the yaw resulting from asymmetric thrust, which must be countered to achieve maximum performance. Think of a single (or a twin with both fans turning) in a sideslip—drag is dramatically increased when the airplane is "sideways" to the relative wind. In a single, the "fix" is to use rudder to center the ball in the turn-and-bank indicator/turn coordinator's inclinometer. But using rudder alone to center the ball while flying a conventional twin with one engine inoperative and its wings level requires substantial deflection. And there's still some moderate sideslip, toward the inoperative engine in this case.



One (incorrect) way to compensate might be to enter a bank of approximately 10 degrees. This attitude, however, still results in a sideslip, toward the operating engine in this instance. In both cases—using either rudder or aileron alone—a sideslip remains, greatly reducing climb performance. Also in both cases, V_{MC} (see the sidebar on page 14) will be higher than published. As the FAA's *Airplane Flying Handbook* (FAA-H-8083-3A) notes, any "attitude other than zero sideslip increases drag, decreasing performance."



The solution—as so often is the case when flying airplanes—is coordinated control inputs. In this case, we need to use both rudder and aileron to find an attitude resulting in zero sideslip. Thus, compensating for the asymmetric thrust generated in an engine-out situation becomes a matter of using coordinated rudder and aileron control inputs to establish a bank of no more than five degrees towards the operative engine—raising the "dead" engine—while maintaining a constant heading. The inclinometer's ball will be displaced approximately one-third to one-half towards the operative engine—a good rule of thumb would be for the vertical lines to bisect the ball, as depicted above. Whichever position the ball finds itself in for a zero sideslip is also the position you want it when turning and trying to minimize drag.

A final note: When a twin is operated in this fashion on one engine, zero sideslip and maximum climb performance result. In fact, our favorite way to know we've nailed the attitude in both bank and yaw is to note a higher climb rate at the same airspeed—best single-engine climb, or V_{YSE}—when the zero-sideslip attitude is attained. Any change in bank or yaw from this attitude is reflected in reduced rate of climb.