THE IMPOSSIBLE TURN

No matter how low the risk of an engine failure is for a turboprop engine, the fact that there's only one attached to the airframe invariably raises "What do I do if...?" We have not been able to find any positive correlation between phase of flight or power changes with engine failures on turboprop engines—so the smart money says it's most likely to happen in cruise because that's where the engine spends most of its time.

With a 17.5-to-1 glide ratio and 700-800 FPM rate of descent, the Epic LT and upcoming E1000 have quite a radius of action should something go wrong at FL280—as well as a fair amount of time to troubleshoot and see if usable power is available.

However, power loss in cruise just isn't what elevates a pilot's pulse rate—it's the loud silence just after takeoff and the question of whether to land straight ahead or attempt "the impossible turn" back to the airport. After flying the Epic, we think that the sheer power and acceleration of this airplane modifies the dynamics of the engine failure on takeoff decision equation. Simply put, the airplane has so much energy within 30 seconds of breaking ground that there's a good chance of making a safe landing following a power loss on takeoff.

To start with, 1200 HP on a clean, 7500-pound airplane means fast acceleration. The book says it will get out and over a 50-foot obstacle in under 2000 feet.

Takeoff procedure is to lift the nosewheel at 80 knots, retract the gear as soon as the airplane begins to climb and raise the flaps when the gear hits the wells while accelerating to 160 knots. On our flights, that speed was reached in less than 30 seconds after breaking ground and the rate of climb was going through 3000 FPM.

Epic Aviation's Chief Pilot Rich Finley demonstrated to us that once 160 knots is achieved, the airplane has plenty of energy to return to the departure runway should the engine fail. The procedure is pull the power lever to idle, the prop to feather and enter a modified Lazy-8: the nose is already high, but pitch is increased and then a turn is initiated. Max pitch, about 25 degrees up, is reached at 45 degrees of turn and the nose starts down—it will get down to the horizon at 90 degrees of turn. Bank is increased through the first 90 degrees of turn, targeting 45-60 degrees.

At 90 degrees of turn, the speed is about 110 knots and the first notch of flaps is selected. The airplane has gained about 500-700 feet since the engine quit. Bank is maintained and the nose drops as needed to hold 110 knots. There's plenty of altitude and energy to get the airplane turned back (a runway return requires more than a simple 180-degree turnaround). The gear is extended and flaps used as needed.

We tried Finley's turn at altitude—it worked. The combination of enough power to generate a lot of altitude in a short time and the low-drag airframe provides a post-takeoff safety margin we've never experienced in a single. The turn will have to be practiced; a pilot who hasn't done Lazy-8s and experienced the constantly changing control forces and complex pitch/bank relationship will need dual.

Finley has also developed what we think is an effective one-size-fits-all procedure for engine power loss in the Epic. It is simply: power to idle, prop feathered and turn toward the nearest airport. We worked through a power loss flow chart he created—up high you have time to troubleshoot, down low you land—and found that it works.

While an engine failure when ATC has you at 4000 feet 30 miles out over Lake Michigan means getting wet, we think the power of the Epic reduces the risk of a bad result during the critical time after takeoff.