TO THE LIMIT
Rhodes, 31, and Cesarz, 23, were on what pilots call a deadhead, transferring an empty plane overnight from Little Rock, Ark., to Minneapolis so it could be ready for a morning flight. The Canadian-built CRJ200 is Pinnacle’s workhorse, making short and midrange hops mostly in the Midwest. From wheels-up, it was clear that Rhodes and Cesarz intended to see what the CRJ200 could do.

Four seconds after takeoff at 9:21 pm, the two pilots did a “pitch up” maneuver that pinned them in their seats with 1.8 g’s of force and momentarily triggered an alert from the airplane’s stall warning system.

Minutes later, Rhodes and Cesarz again yanked back on the control column, rocketing the plane upward and generating over 2.3 g’s of force before they eased off the flight controls. After briefly leveling off at 37,000 ft., the crew set the autopilot to climb at 500 ft. per minute—more than twice the fastest recommended rate—to the airplane’s maximum altitude of 41,000 ft.

As the plane rose, it succumbed to the physics of high-altitude flight: Thin atmosphere offers less lift and robs the engine of air. Stuck in an aggressive climbing mode, Flight 3701’s speed began to drop. To maintain the rate of climb, the autopilot angled the nose of the aircraft up, slowing it further. By the time the aircraft reached 41,000 ft. and leveled off, it was flying slowly, at 150 knots indicated airspeed, and was perilously close to losing aerodynamic lift—or stalling.

“This thing ain’t gonna [expletive] hold altitude,” Cesarz said.

“It can’t man,” Rhodes replied.

“We [cruised/greased] up here but it won’t stay.”

The combination of high altitude and low speed once again triggered the Bombardier’s stall warning system. First, “stick shakers” rattled the control columns and disengaged the autopilot to alert the crew of an imminent stall. When the crew didn’t lower the plane’s nose to gain speed, “stick pushers” forced the control columns forward. The flight data recorder shows that Rhodes and Cesarz overrode the stick pushers three times and forced the plane’s nose back up. At 9:55 pm, as they pulled up for the last time, both engines flamed out.

“We don’t have any engines,” one of the pilots said.

FAILED EFFORTS
While the altimeter spun downward, the crew hurriedly reviewed their options for restarting the engines. At that altitude, there were six suitable airports within reach for a forced landing. Despite the serious nature of their predicament, the pilots did not notify air traffic control (ATC) of their situation or request emergency landing clearance.

First, they tried a “windmill restart” by diving to increase airspeed. The maneuver is intended to force air into the engine housing, spinning the rotors and creating enough compression for ignition.