

Lowdown on go down



Speed brakes for single-engine piston aircraft

BY RICH NAGLE

The good news was that it was a beautiful, sunny autumn day in the Colorado Rockies while descending in my Piper Turbo Saratoga from Flight Level 200 through 15,000 feet on my way to a fuel stop in Rifle. The bad news came from Denver Center in response to my call of “field in sight.”

“Saratoga Eight-Seven-Alpha, cleared for the visual approach at Rifle. Change to advisory frequency approved. Cancel IFR with me or on the ground with flight service.” That sounded fine except for the need to descend 8,000-plus feet to Rifle’s 6,500-foot pattern altitude in about 10 miles. Even if I had managed to pick the field out of the earthy brownness farther out, I would have needed to expedite the descent. Like many aerodynamically clean aircraft, the Saratoga tends to pick up speed like a frightened rabbit when you lower the nose. With the big Lycoming TIO-540 in front you can’t—with a clear

conscience and limited funds—chop and drop.

Not a problem. Keeping the power at 22 inches, I pushed a button on the panel, and two small, flat pieces of metal with round holes rose from the middle of each wing—speed brakes. Airplane goes down, air and ground speeds stay stable, and the engine stays warm, keeping shock-cooling fears at bay. Life is good.

Speed brakes in a single?

Many general aviation pilots associate speed brakes or their lift-dumping cousins, spoilers, with gliders or jets. It may seem odd, maybe even seem like overkill, to have them on a single-engine piston airplane. But the piston pilots who have flown with them uniformly say one thing: “Why didn’t I get these sooner?”

“The speed brakes really make it a more complete airplane,” said Ed Small, who flies his 1965 Piper Twin

Comanche 400 on business and personal trips from his home in Calgary, Alberta. “They are a flexible tool that broadens the scope of my flying. I can keep power and speed up longer, descend, slow to gear speed, and use them intermittently on approach or in the pattern while protecting the engine.” Small’s Piper is powered by a hefty Lycoming IO-720 powerplant. “The health and well-being of that big engine are extremely important.”

The speed brakes, made by Precise Flight, of Bend, Oregon, are machined from aluminum sheets. They are controlled with a button on the panel, with indicator lights showing that both brakes are fully deployed. There are no airspeed limitations on their use beyond those that apply to the airplane. The only restriction is to not use them in icing conditions. Depending on the aircraft, there may be a slight rumble when they are deployed.

The company says about 5,000 speed-brake kits have been installed since their introduction in 1982, many of them factory installed on Mooneys. The speed brakes have evolved over time, and were first vacuum- and later hydraulically actuated. The current electrically actuated "2000 Series" kits were first used in the late 1990s beginning with the New Piper Malibu. There have been occasional reports of various component failures or lubricating grease becoming overly stiff in very cold temperatures preventing deployment of the brakes. Precise Flight says it has addressed those issues and continues to make improvements based on customer feedback. As a safety measure, if one brake fails to extend fully, both retract, and the airplane continues to fly the old-fashioned way. The Precise Flight speed brakes are currently certified for Beechcraft Bonanza 33, 35, and A36 models; most Cessna 210s; Piper PA-28, PA-32, PA-24, PA-30, PA-39, and PA-46 aircraft; Mooney 200-series models; Lancair certified 300, 350, and 400 models; and Lancair experimentals including the Lancair IV, Legacy, and ES.

There are similar systems available for piston twins and for homebuilts. Spoilers Inc., of Gig Harbor, Washington, makes a hydraulically actuated spoiler system available for a range of twin-engine piston aircraft including the Cessna 310R, 337, 340, and 400 series, the Beechcraft Baron and Duke, the Piper Aerostar, and for the New Piper Malibu/Mirage. Spoilers, which are panels that rise 60 degrees from the upper wing surface, create drag and dump lift to accomplish speed and altitude reductions. Spoilers Inc. says its systems can be used in icing conditions. Aero Options Inc., of Mattawa, Washington, also produces a speed-brake kit for high-performance composite homebuilt aircraft including the Lancair IV-P.

Small added speed brakes while overhauling and updating his Twin Comanche, as did Jeff Jelinek, of Renton, Washington, who has spent six of the eight years he's owned his 1960 M-model Beechcraft Bonanza on an exhaustive spinner-to-tail update. "Speed brakes were among the final items I had installed," he said. "In retrospect, they are among the most important and useful items because they give me a host of options in all phases of flight." For Jelinek, the impetus for



Precise Flight manufactures electrically actuated speed brakes that are certified on a great number of aircraft.



adding speed brakes was the installation of a 300-horsepower Continental IO-550 engine. "The performance increase was incredible, but I had a very difficult time slowing the airplane down to gear speed without the risk of shock cooling the engine. The speed brakes totally solved this problem."

What goes up

Slowing down and going down is why Matt Ramsey uses speed brakes in the 1982 Cessna T210N he transformed into a nicely equipped, known-icing, IFR cruiser. Ramsey flies year-round from his home base in Palo Alto, California, to a second home near Truckee-Tahoe Airport in the Sierra Nevada. The winter clouds common on the west side of the mountains typically break up before reaching the 6,000-foot-elevation airport just to the east. "At 15,000 to 11,000 feet I am visual with the airport, cancel IFR, and begin a circling descent. But you can't just pull the plug on the throttle," Ramsey said. "I'll have power at 20 inches, deploy the brakes, then later,

gear and flaps. It's comforting to know you have the flexibility to control your speed and rate of descent and manage the engine."

Flexibility is the key for Craig Bowcock, who flies his 1979 F33A Bonanza with speed brakes from an airport in Oregon when he's not flying a Boeing 767-400 across the Pacific Ocean as a first officer for Continental. "You've got a lot more options," said Bowcock, who uses the speed brakes to reduce the need for circling into valley airports, for short fields, for decreasing airspeed after landing in gusty crosswinds, and on the occasional less-than-optimal approach. "Sometimes all your planning just goes out the window for one reason or another."

Going from jet to prop and back is something Alan Rockey does a lot as aviation manager and pilot for The Sharper Image. He has the enviable task of flying everything from a North American P-51 Mustang to a Dassault Falcon 2000, but his current favorite is the company's 1998 A36 Bonanza used for training and store visits. "Let's face



Spoilers rise 60 degrees from the upper wing surface, creating drag and thereby reducing speed and altitude.

it, we use the airplane because we want to get from A to B faster,” Rocky said. “I tend to press onto the field a little harder [by staying at altitude longer] knowing I have the advantage of speed brakes. I can slowly cool the engine and keep the power up through the transition to gear down and flaps without having to first reduce power to slow, then add power to make up for drag.”

Ed Novak of Shoreline Aviation in Marshfield, Massachusetts, has installed more than 25 Precise Flight speed-brake kits in Bonanzas, Saratogas, Mooneys, and 210s. The installer “has to have some sheet-metal experience, but they’re not difficult to install,” Novak said. He also has experience with installing and maintaining Spoilers Inc. systems.

Novak said that even on Bonanzas with relatively high gear and flap speeds, “speed brakes save wear and tear on the gear and motor and are easier on the airplane because you can use them up to redline speed.” The brakes take from 30 to 50 hours to install, depending on the airplane. The finished installation is clean and aesthetically pleasing, showing only the flush-mounted stainless-steel caps and a sticker informing an observer not to try to pry them up.

‘Fixed wing or rotorcraft?’

Surprise in seeing the utility of the speed brakes doesn’t always come from those in the airplane. Jelinek was returning to Seattle from Michigan last fall at 15,000 feet when the on board weather display showed reports of clouds and icing in Washington’s eastern Cascades all the way down to 5,000 feet. Seattle Approach

approved a descent through a small break in the weather, but only if he could also stay clear of the nearby Seattle Class B departure corridor. “With speed brakes deployed I maintained a 2,500- to 3,000-fpm descent without excessive airspeed all the way down until I was clear and vectored into home base at Renton. The amazed controller asked, ‘What are you flying, fixed wing or rotorcraft?’”

In the flatter Eastern and Central United States, the speed brakes give you the option to stay ahead of the airplane and say “wilco” to ATC’s speed-for-spacing instructions or the not-untypical slam-dunk approach, instead of responding “unable” while you prepare to implement plan B. For pilots adding capability to their current airplane or stepping up to a higher-performance airplane, speed brakes can make the transition and ongoing operation a smoother process.

“One of the common mistakes I see with pilots transitioning to faster aircraft is slowing down prior to conducting an approach or entering the traffic pattern. Speed brakes can control this problem,” said Scott Dennstaedt, a CFII and owner of Chesapeake Aviation Training in Ellicott City, Maryland. Dennstaedt conducts advanced training in high-performance aircraft and has more than 1,000 hours in Cirrus and Lancair aircraft as a factory-authorized instructor. “When I first trained in an aircraft with speed brakes my first reaction was, ‘Why don’t all aircraft have these as standard equipment?’ If you have them, use them as part of your routine flying. If they are not on the appropriate checklists, add a line for them,” he said.

We fly high-performance airplanes with big powerplants to get to places efficiently and expeditiously. Paradoxically, speed brakes help you to get there

faster by enabling you to slow down with less wear on the engine, the airframe, and the pilot. They are a great tool for getting the maximum utility and

value from your airplane.

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i Links to additional information about speed brakes may be found on AOPA Online (www.aopa.org/pilot/links.shtml).