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GENERAL AVIATION NEWS

Laminar Flow Systems can tweak your plane for a big performance boost

Pilot's Report 5/30/2002
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For General Aviation News

Robin Thomas is a man of many talents, most of which relate to tweaking more speed out of stock aircraft with stock engines. And with this, the president and CEO of Laminar Flow Systems has been very successful because he delivers exactly what he promises.

We reported on the tuned exhaust system, developed by Mr. Thomas' other company, Power Flow Systems, in the Oct. 26, 2001 issue of *GAN* whereby a speed increase of 6.5 miles per hour was realized on a modified Piper PA28-140.

This time, we were back to evaluate further performance increases on the same aircraft, thanks to aerodynamic improvements.

Laminar Flow Systems (LFS), based in Daytona Beach, Florida, is the older of Mr. Thomas' two companies, which formed in the U.S. Virgin Islands in 1983. Operating an air charter company, Mr. Thomas became frustrated over the performance of one of his aircraft, a Piper Seneca. For over a year, he tinkered with aerodynamic clean-up until he was satisfied with the improvements. Rightly recognizing that his efforts could benefit a variety of aircraft, he founded LFS and has been delivering speed kits ever since.

But all was not roses in paradise. St. Thomas was too remote for Mr. Thomas to stay up with his competitors and on top of his imitators. Ergo, the move to Daytona Beach in 1996.

During this year's Sun 'n Fun show, Darren Tilman, general manager at LFS, was kind enough to bring the Piper to Kissimmee, Florida, for an evaluation of the speed kit — or I should say kits — as the whole consists of several speed-enhancing elements, available separately or all together.

As we did the preflight checks, Mr. Tilman showcased the improvements. The most obvious were the speed pants or main landing gear fairings. These are an improved version of the fancy pants and can be installed and removed in one piece. LFS claims a 10.5-mile-per-hour increase over the same type aircraft without fairings. The speed pants are also lighter, stronger, more efficient and $1,000 less expensive than the fairings offered by Piper. Finally, an improved nose gear treatment should net you another two miles per hour.

Hinge fairings and gap seals for the flaps and ailerons offer an additional 5.5-mile-per-hour increase, as does the wing smoothing and fuel tank fairing process whereby rivet lines are covered to reduce drag, and any dimples in the wing surface are filled in with Bondo. These patches are then sanded and checked for uniformity with a meter provided as part of the kit. The wings are then repainted.

It was time to compare these projections with the real world — in the air.

As with previous flights I had made on this aircraft, we were close to gross weight with two people, tanks almost full and over 300 pounds of recording and calibrating gear on the back seats.

Departing Kissimmee to the south to clear Orlando's Class B airspace, Mr. Tilman decided to commence our calibrated climb at 1,500 feet above sea level, ascending to 8,500 feet, noting the numbers every 500 feet.

In 20 seconds, we were off the ground and climbing at 900 feet per minute at 90 miles per hour indicated air speed (slightly higher than best rate of 85). Leveling at 1,500 feet to clear the Class B, indicated air speed was 145 miles per hour.

Cleared to ascend, we started our climb at full throttle and full rich mixture, clocking a rate of climb of 900 feet per minute. Fuel flow was 13.5 gallons per hour. Passing 5,000 feet, we were still climbing at 550 feet per minute and leaning was commenced, reducing fuel flow to 11.1 gallons per hour. Arriving at 8,500 feet, rate of climb was still a respectable 400 feet per minute with a total time-to-climb of 13.97 minutes.

How did this compare to the unmodified baseline Piper? The LFS aircraft, which also had the tuned exhaust system installed, arrived at altitude 6.46 minutes faster (13.97 minutes versus 20.43 for the stock aircraft) and with a 48% increase in rate of climb (465 feet per minute average versus 318 for the stock aircraft).

Leveling for a speed run, our true airspeed pegged at 150 miles per hour, or 28 miles per hour faster than the baseline aircraft.

The airspeed indicator was checked by flying three different headings and correlating the data with the GPS to eliminate error.

Leaning the aircraft further and reducing power to match the true airspeed of the stock aircraft resulted in a fuel flow reduction of 2.8 gallons per hour below that of the baseline aircraft. So a pilot can fly the same speed as the stock aircraft with reduced fuel flow and extended range or cruise at a significantly higher airspeed with the same fuel flow and range as the standard PA28-140.