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The Boeing [NYSE: BA] 787 program has made a subtle but important change to the airplane's livery to enhance airplane performance. By developing a method for maintaining a smooth flow of air -- called laminar flow -- over more area on the 787 nacelle inlet, Boeing is able to reduce aircraft drag and fuel consumption.

The 787 nacelle has a tightly controlled smooth surface to preserve laminar flow over a greater distance than that on a standard design. "Aircraft drag is reduced because laminar flow has much lower skin friction drag than turbulent flow," said Ron Hinderberger, propulsion leader for the 787 program.

To achieve laminar flow over the inlet it is necessary to maintain a very smooth, continuous surface without paint edges, which can occur when paint transitions from one color to another, or as paint details are added. The design parameter for the nacelles is based on thickness of the paint formulation for a single color; Boeing has chosen gray to complement the metallic appearance of the nacelle's inlet.

"If you interrupt the laminar flow by adding paint layers, which are common with airline liveries, you could increase fuel burn by 30,000 gallons per year per airplane," Hinderberger added. "An improvement like this -- especially with rising fuel prices -- can contribute positively to the bottom line for an airline."

Scheduled for delivery beginning in 2008, the Dreamliner provides passengers with a better flying experience and operators with a more efficient commercial jetliner. Because it uses 20 percent less fuel per passenger than similarly sized airplanes, the 787 is designed for the environment with lower emissions and quieter takeoffs and landings. Inside the airplane, passengers will find cleaner air, bigger windows, more stowage space and improved lighting. To date, 28 airlines have logged 403 orders and commitments worth more than \$55 billion at current list prices since the 787 launch in April 2004, making the Dreamliner the most successful commercial airplane launch in history.

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