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http://www.socialstudent.co.uk/boeing-787-dreamliners-catastrophic-software-bug/
What is the Boeing 787?

- The Boeing 787 is the most recent wide body commercial aircraft currently produced.²

- The 787 is referred to as a More Electric Aircraft.²

- More Electric Aircraft - an aircraft designed to replace most traditional systems in an aircraft with electrical subsystems, excluding propulsion.²

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What is Eco Friendly?

- Eco Friendly products are those that are designed to reduce or remove harmful environmental impacts.

- The Boeing 787 is one of the first generation of aircraft that holds design emphasis on being Eco- Friendly.²

Electrical Subsystems

- The 787 uses electrical systems to replace systems that used hydraulics in previous generations of aircraft.  

- These Systems Include: Electric bleed air system (electronic climate control), electric brakes, electric flight surface actuation, and electric engine start.

- Use of electronic systems reduces the weight of hydraulic and mechanical systems (tubing, fluid, pumps vs servo) while reducing needed maintenance.

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Airframe

- The Boeing 787 contains 50% composite, 20% aluminum, 15% titanium, 10% steel and 5% other material.¹

- The lightweight of this aircraft makes it more efficient and have a larger range than current airliners.¹

- The Dreamliner has twice the maintenance interval compared to the Boeing 767.¹


Propulsion Systems

Rolls-Royce Trent TEN 1000
- Uses 20% less fuel than the CF6
- Adaptive cooling system
  - Lowers fuel burn rate
- Fan Aerodynamics improved
  - Reduces the sound produced
- Lightweight fan blades
- Around 95,000lbs of thrust
- High pressure fan
- Uses composite metals

Boeing-767 GE CF6 Engine
- Around 63,500lbs of thrust
- Low pressure fan
- Uses heavy metals
Propulsion Systems cont.

**General Electric GEnx Engine**
- Uses carbon fiber materials
- 15% less fuel consumption
- 15% less CO₂ emissions
- LPT using aluminum alloys
- 2% less fuel burn

**Boeing-767 GE CF6 Engine**
- Low pressure fan
- Uses heavy metals

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http://www.geaviation.com/commercial/engines/genx/
Design Challenges

- The electric subsystems of the 787 have led to multiple incidents. Including a fire which is pictured to the right, and took place on January 7, 2013.  

Future Improvements

- Boeing Volt Program\textsuperscript{12}
  - Electric propulsion

- Boeing Freeze Program\textsuperscript{12}
  - Liquified natural gas

References


