

Aircraft diesel engines essay example

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Aircraft diesel engines

Aircraft diesel engines, commonly known as aero diesel engines, are a form of aircraft engine that began being built in the 1920s and 30s. These compression-ignition engines use diesel as the major fuel. The first diesel engines to be built were the Junkers Jumo 205 and the Packard air-cooled radial diesel engines that were used to fly aircrafts, they were not very successful. The Packard air-cooled radial diesel engine was the first diesel engine to fly an aircraft built in 1928 and was made in a similar air-cooled radial design used in the Wright and Pratt designs (Mollenhauer, Krister, & Tschöke, 2010). The Stinson model SM-IDX Detroiter was the first aircraft to fly running in a diesel engine in September 1928. The major reason for using diesel in these engines was its low risk of fuel fire. In the early 1930s, the two-stroke Junkers Jumo 205 engine was introduced and was used with by the Blohm & Voss Bv 138 and 139 trimotor maritime patrol flying boats. This new opposed-piston engine gained increased use as compared to the previous Junkers Jumo 205 due to its use in both the Blohm & Voss Bv 139 and in the airship. In Europe, diesel engines were manufactured mainly in Britain, Germany, the Soviet Union, and France. In Britain, Napier & Son built the Junkers Jumo 204 engines and Daimler-Benz made the Zeppelin diesel engines in Germany (Underwood, 2008). The Soviet Union made the Charomskiy diesel engines used in their bombers and the French built the Clerget diesel engines used in the MB203 bomber prototype.

Advantages of Aircraft diesel engines

Diesel engines start instantaneously and have better fuel efficiency as diesel engines burn diesel from 20% at full power up to 50% at long range cruise per gallon resulting in the usage of less fuel as compared to ignition engines and increasing the range and payload. Diesel engines are safe to use as there is minimal risk of fire on board the plane. Diesel engines are also very easy and cheap to maintain as they have lower operational costs as compared to piston-ignition engines. These engines comply with the established United States DoD requirements for using only one type of fuel. Diesel fuel is readily available as compared to the currently used gasoline, as problems concerning the accessibility of gasoline continue to be a major challenge today. Diesel engines eliminate electromagnetic noise since they do not use a ignition system which helps to reduce noise interference from the communication and navigation systems in the plane. In addition, diesel engines are more durable because diesel provides increased lubricity and does not require any electrical system for ignition.

The current competition in aircraft diesel engines

Aircraft Diesel engines have begun to face renewed interest especially due to the continued shortage in the supply of aviation gas and the major improvements that have been made to diesel engines over the years resulting in increased power-to-weight proportions as compared to earlier diesel engines. There are diesel engines being made that can produce up to 350HP and new innovations are quickly enabling the production of diesel engines that are able to compete with turbine engines producing up to 500HP and more (Mollenhauer, Krister, & Tschöke, 2010). There has been an

increase in the number of manufacturers making new aircraft diesel engines that power light planes and new aircraft designs are being made that are designed to use diesel engines.

Current manufacturers of aircraft diesel engines include Deltahawk, Wilksch Air Motive, Austro Engines, Continental motors inc., Centurion Aero, and SMA of the Safran Group. All these companies have manufactured diesel engines that are currently being used in light planes. A few of these diesel engines have already received certification for use in Europe but most are still prototypes or in advanced stages of experiments as the various manufacturers try to make the most appropriate design for commercial aircraft use. Other several manufacturers have various diesel engines that are in the research and development stage. For instance, Raptor Turbo Diesel LLC, Powerplant Developments and the Zoche Company. example of a company that has already released its diesel engine and making returns out of it is Africair. According to their facebook marketing updates, Africair has a Middle East Aviation (MEBA) expo with representatives at Bell Helicopter as well as Textron Aviation chalet. Another one that achieved certification is Diamond Air with the engine Diamond DA42 NG--a 170-horse-power Austro 300 diesel engine (duCros, 2009).

The future of aircraft diesel engines

The renewed use of the aircraft diesel engine now looks to be inevitable as the costs of fuel increases around the world and scarcity issues hit various countries across the world. The increased development in diesel engines is also an important factor that makes the future use of diesel engines more certain. The introduction of four-stroke, turbocharged -diesel, geared engines

has been a major step towards the use of diesel engines. These engines, manufactured by Thielert, were certified and used for retrofitting in the Piper Cherokees and the Cessna 172s (Reif, 2014). Major prototypes being made are based on this design, with some being certified for use, and the reset form the basis for future use within the industry.

Involvement in this technology

References

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