**Section 2 - Rotary Engines & Applications**

**2.1 Applications of The Wankel Engine**

Due to the Wankel Engine's power-to-weight ratio, reliability, and small area it accumulates allow for applications in many differing aspects of the engineering world. The initial application of the Wankel Rotary Engine was within aircrafts during the 1950s, as the design was first becoming more popular. This application was later abandoned with less and less aircraft utilizing this engine and transitioned to the jet engine. This engine, however, was employed in small aircraft, primarily due to the lower cost of management, production and maintenance.

Within recent decades the Wankel engine has been employed within compact size and quiet running aircraft such as drones or UAVs. Other private enthusiasts, small companies and hobbyists continue to adapt the Rotary engine into aircraft.

Small scale Wankel engines have increasingly popular roles within machinery and applications such as:

* Go-Karts
* Personal Water Craft
* Auxiliary Power (for Aircraft)
* Model Airplane
* Vehicles

**2.2 Applications of the Wankel Design**

Furthermore, apart from internal combustion, the Wankel design has been utilized for **air compressors**, and **superchargers**due to its advantages in reliability, size and weight.

Note: If a supercharger was to be employed as part of, or onto a Wankel engine, the supercharger is actually **TWICE THE SIZE** of the engine itself.

Alike, the Wankel design has also been used within **seat belt pretension** **systems**. This can be found within Volkswagen New Beetle vehicles - as deceleration occurs, sensors detect a potential crash and explosive cartridges are triggered electrically, causing gas to be fed into a small Wankel engine that rotates to take up the slack of the seat belt. This halts the driver and passengers in the seat.

**2.3 Mazda**

The Rotary engine has been most defined by its application within vehicles - most specifically the vehicular production company of Mazda. The rotary engine debuted in Mazda's first vehicle within 1967 known as the Cosmo Sport - this would be a definitive moment in the automotive history and had begun the journey of the engines rise in popularity. The Rotary engine soon would have a timeless cult following.

The companies popularity would not have been made possible without this engine and vice versa. Within vehicles the advantages allow for outstanding performance, gaining the attention of car enthusiasts and opened a market for the company to dwell into. Furthermore, in a post-war era, Japan's Ministry of International Trade and Industry was desperate to define themselves into the competitive global sector of automotive architecture. At the time Mazda was a small automotive manufacture and hence, architects and the industry had the aim of streamlining their focus to the US and European market, while completing with other carmakers. Mazda took a less conventional approach and did not merge into a larger automotive company - the new Rotary engine would be a part of their new age thinking and symbolise their push against the tradition.

The Cosmo Sport would be a vehicle that utilized the Rotary engine and was marketed into society as being something more than just a machine to travel from A to B. Therefore, in 1967 Mazda cemented their reputation as a "small but highly influential carmaker".

**2.3.1 Notable Rotary Engine Vehicles (Mazda)**

1. 1969 Mazda Luce R130 Coupe
2. 1970 Mazda RX500
3. 1993 Mazda RX - 7
4. 2003 Mazda RX - 8