



# WANKEL ENGINE USER REFERENCE MANUAL

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Dear customer,

Congratulations on the purchase of your new vehicle. As you are already aware, your car contains a Wankel engine, a type of internal combustion engine which is slightly different from a standard piston engine. This reference manual is meant to familiarize you with this type of engine.

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### Section 1: Overview of a Wankel Engine

The Wankel engine was developed in the 1950's by a German engineer named Felix Wankel. The Wankel engine, also referred to as a rotary engine, has only three moving parts: an eccentric shaft and two rotors. In principle the Wankel engine produces power similarly to a piston-cylinder engine through the four stages of the Otto Cycle: Intake, Compression, Power, and Exhaust. However, the Wankel engine contains a rotor that rotates continuously in one direction inside an oval-shaped compartment thus creating power.

## Section 2: Wankel Engine Components

Diagram 1 below will help you become familiar with the structure of a Wankel Engine and identify the location of the basic parts.

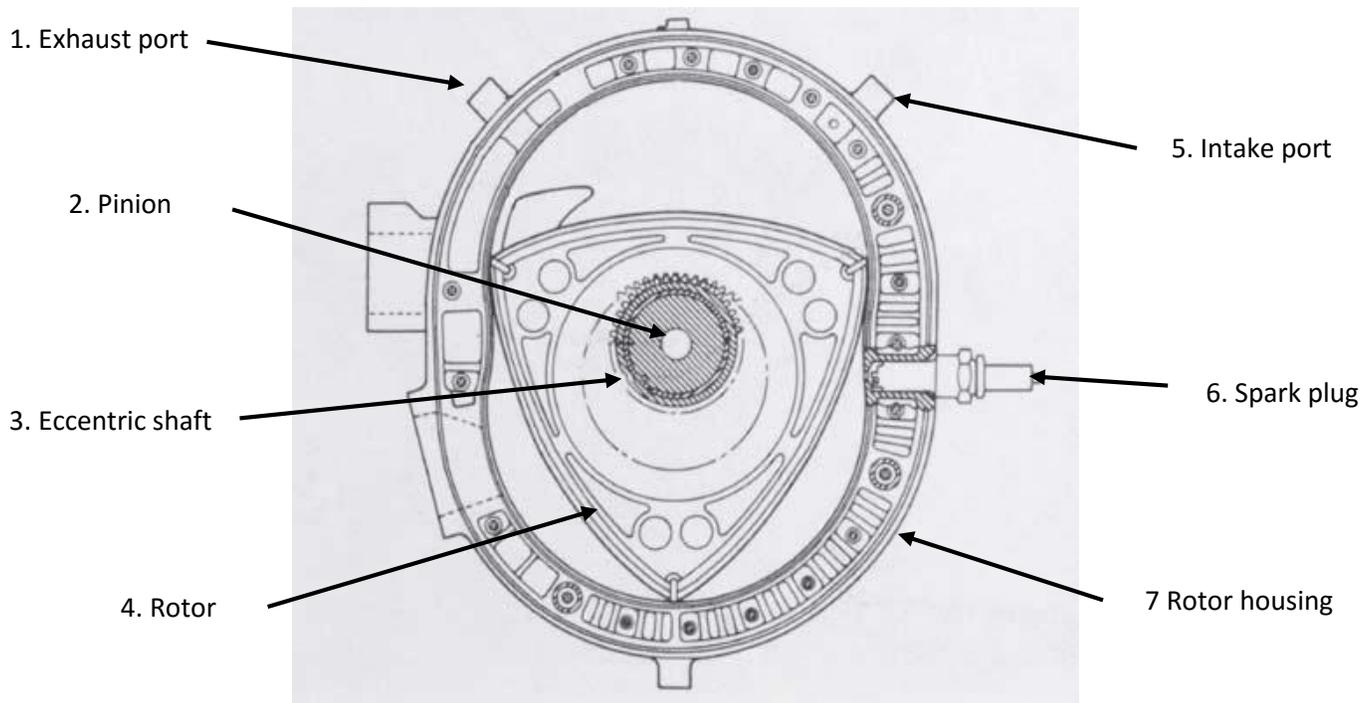


Diagram 1: A Wankel Engine

Below is an explanation of each labeled part in Diagram 1. These will be referred to later in the manual.

1. **Exhaust port** – space through which gas is expelled
2. **Pinion** – fixed gear, point on the eccentric shaft around which the rotor rotates
3. **Eccentric shaft** – rod that the rotor connects onto
4. **Rotor** – triangular shaped iron rotating piece
5. **Intake port** – space through which air is drawn in
6. **Spark plug** – the device which causes the combustion
7. **Rotor housing** – aluminum combustion chamber

### Section 3: How a Wankel Engine Works

A Wankel engine consists of a rotor which sits inside the rotor housing and rotates orbitally around the pinion. As the rotor orbits inside the housing, it pushes the pinion around in tight circles, turning three times for every one revolution of the rotor. This path keeps each of the three peaks of the rotor in contact with the houses, and creates separate volumes of gas. Each side comes closer and then further away from the wall of the housing during which the combustion chamber is compressed and expanded. This process occurs through the four stages of the Otto Cycle as outlined below.

- Stage 1: Intake – The rotor moves past the intake port. An air-fuel mixture is drawn in through the intake port and the volume of the chamber expands.
- Stage 2: Compression – The rotor continues its motion around the housing and compresses the air-fuel mixture.
- Stage 4: Power - The spark plug ignites the air-fuel mixture causing the pressure to build, combustion forces the rotor to move, and the pocket to expand.
- Stage 4: Exhaust – The rotor continues to move and the chamber contracts, forcing the used air-fuel mixture out of the exhaust port. The cycle then repeats.

### Section 4: Advantages of a Wankel Engine

As the lucky owner of a motor vehicle containing a Wankel Engine, take a minute to familiarize yourself with the benefits of your car engine.

- ❖ Higher power output
- ❖ Wide speed range allowing for greater adaptability
- ❖ Slim chance of overheated engine or malfunction
- ❖ Operates with virtually no vibration
- ❖ On some models the engine oil remains uncontaminated therefore eliminating the need for oil changes
- ❖ Environmentally friendly