**THE DIESEL ENGINE**

* The diesel engine was invented in 1893 by Rudolf Diesel.
* It is also called **compression-ignition** engine.
* It does not need an electric spark to be started.
* When the ignition key is turned to start, the fuel passes through a couple of **fuel filters**, in order to be cleaned before reaching the injector noozles.
* The fuel is **sprayed** into the combustion chambers through **fuel injector nozzles** just when the air has been placed under great pressure.
* The temperature of the combustion chamber is hot enough to **ignite** the fuel **spontaneously**.
* The combustion chamber is usually pre-heated.

**DIESEL ENGINE VS. GASOLINE ENGINE**

**Similarities**

* Both have the **basic four-strokes** (intake – compression – power - exhaust)

**Differences**

* Gasoline engines need an **electric spark** to produce combustion while in diesel engines the **ignition** happens **spontaneously**.
* In gasoline engines, the fuel injected in the combustion chamber is a **pre-mixture** of air and gasoline while in diesel engine the fuel doesn’t properly mix with air and it is sprayed in an **atomized** way into high temperature air, so mixing happens only during the combustion.
* Diesel engines use a **fuel injector** while gasoline engines use a **spark plug.**
* Gasoline engines are less noisy and vibrates less than diesel ones because the combustion process is smooth and propagates well.
* Diesel ingines require a more rugged structural design than gasoline engines.



* Diesel engines can achieve a **higher compression** without risk of self-ignition while in gasoline engine it’s not possible. The higher the compression ratio the better the efficiency of the cycle. That’s why diesel engines have better **fuel economy** as compared to gasoline engines.

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| **DIESEL ENGINE** | **GASOLINE ENGINE** |
| Four-stroke engine | Four-stroke engine |
| Use fuel injectors to make fuel reach the combustion chamber | Use spark plugs to start the combustion process |
| The fuel doesn’t need an electric spark to be burnt | The fuel needs an electric spark to be ignited |
| Diesel fuel is less volatile, doesn’t mix properly with air,  mixing happens during the combustion | Gasoline is volatile and easily mixes with air, gasoline and air are pre-mixed before reaching the combustion chamber |
| High compression in the combustion chambers | Compression is lower to avoid self- ignition |
| Better fuel economy |  |
| More rugged and costly engine |  |