

How Car Engines Work



“A car engine is one of the most amazing machines we use on a daily basis” Marshall Brian, *creator of HowStuffWorks.com*

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English 202
6/6/2013

Introduction

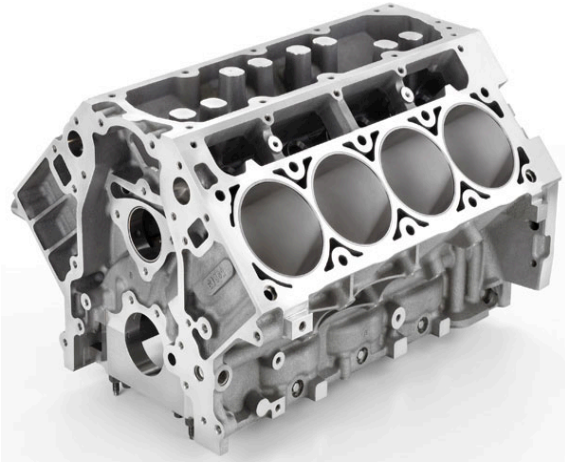


Figure 1: Engine Block

A car engine is one of the most used machines on a day-to-day basis, and yet just very few people really know how they work. It is always good to know how the things you use work, specially the things you use daily. This description is going provide all the basic information of how a normal car engine works from the moment you put the key in the hole until the car is already moving. You will learn what goes inside and what happens - in a matter of seconds - that makes the car move.

What Exactly is an Engine?

An engine is the mechanical machine that powers almost all the vehicles in the world. Even though each machine has its own engine, they are all base on the same principle of how they work. To get to know the engine we need to know what the basis of everything, what's the actual process the engine does to move the car, what happens when you press the gas pedal. It is actually quite simple; they have what are called cylinders.

Types of Engines

There are two main types of vehicle engines in the world; those are two-stroke and four-stroke engines. The most popular type nowadays is the four-stroke engine. Since it is more elaborate, organized, and damages noticeably less the engine. 4, 6, or 8 cylinders compose most of the car engines now. The four-stroke engine has 4 steps which will be shown here, but for this engine to work you need something to start it, and this is where the starter comes.

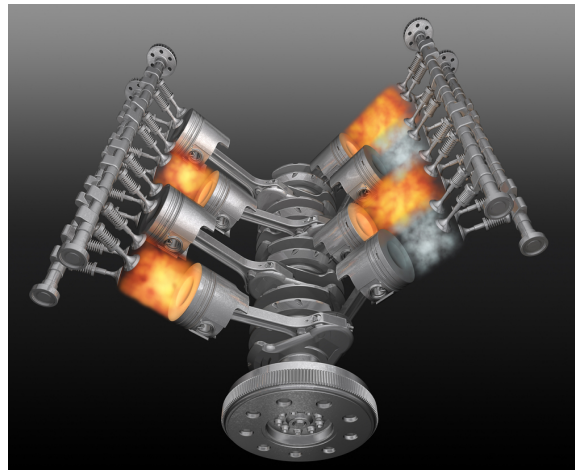


Figure 2: The 8 cylinders of an engine in the shape V.

Cylinders

The cylinders are the main part of the engine, which makes the whole thing move. Those are the parts where the fuel is injected for the car to move. Inside these cylinders there are pistons, which are small pieces that get shot up and down the cylinder to create the energy needed for the process to start.

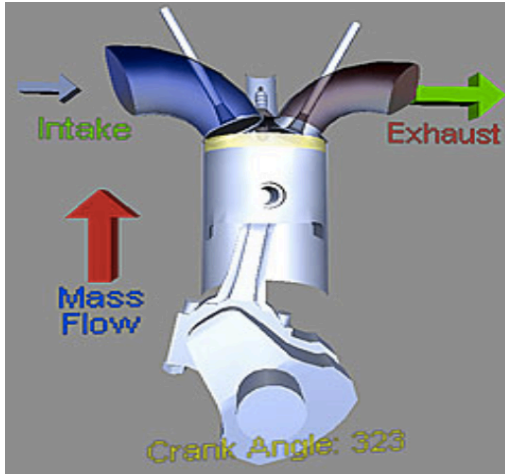


Figure 3: Cylinder with both Valves.

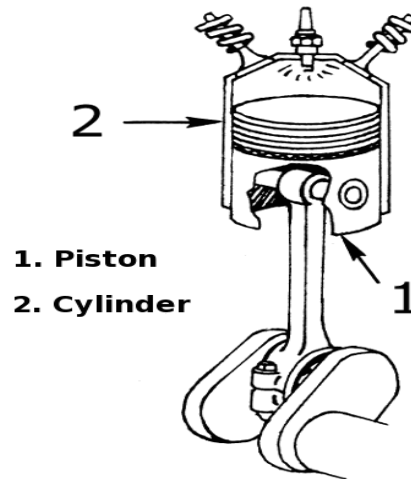


Figure 4: Cylinder with the piston.

A cylinder is a very simple piece that consists of 4 main parts in it. It has two valves (Intake and Exhaust), the piston, and in most cases the spark plug, which is the little piece at the top in figures 3 and 4.

Starter

The starter is a little electric engine located close to the car engine, powered by the car's battery, that when you turn the car key around, you turn on the little engine which gives a small push to start moving some gear that ends up turning the car on. Now that the car is on and on 'Drive', you need to start moving, and this is where the engine part comes.

First Stroke: Intake

This is the first of the four steps that compose the four-stroke engine. It is called the intake and this is when the piston in cylinder goes down creating an empty space. As it is going down the cylinder, the Admission Valve (refer to figure 3) is opened, injecting a mixture that is sucked by the empty space formed by the piston into the cylinder.

Second Stroke: Compression

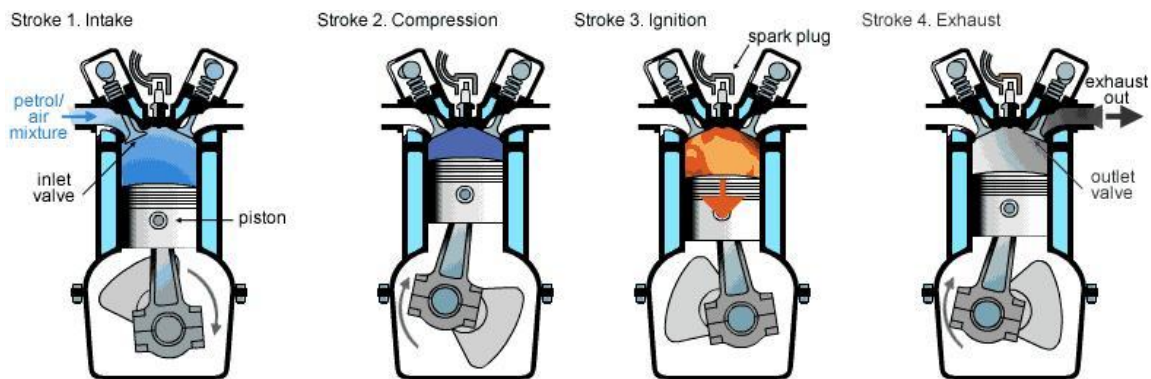
Compression happens when the piston starts to go up from the bottom, with both the Admission Valve and the Exhaust Valve (refer to figure 3) closed, the piston creates compression with the gasoline and air locked on top of the piston. Compression is done when the piston is at the top of the cylinder.

Third Stroke: Explosion

Explosion happens when the mixture of air and gasoline is compressed at the top of the cylinder. A little spark is created by the spark plug located at the top of the cylinder that creates an explosion that makes the piston shoot down, generating the energy needed to move the axis.

Fourth stroke: Exhaust

After the piston is shot down, it goes up again and as it goes up, the exhaust valve is opened for all the smoke to leave the cylinder. And when the piston reaches the top, the exhaust valve is closed and the intake valve is opened again, for the same process to start all over again.



Conclusion

Car engines are one of the most important machines people use and depend on in a daily basis. Most people don't even care what's inside the hood as long as it gets them wherever they want, and let the people at the shop worry about it. Having a basic knowledge of a machine you use every day could really help you, specially on emergency situations in case there is no one around to help. These four simple steps are the main functions of working car engine: Intake valve injects gas, piston compresses the gas with the air, the spark plug creates an explosion making the piston move quickly down and when it goes back up the smoke and waste is released by the exhaust valve.

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