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What Do You Mean by Four Stroke?

By Thomas Yoon

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What is a 4-stroke diesel engine?

As the name suggests, these engines work on reciprocating actions of pistons. One stroke means one linear motion of the piston in one direction. When the piston moves in the opposite direction, that is counted as another stroke.

For a 4-stroke engine, the piston has to move up, then down, then up again, and then down again to complete one cycle of the engine. In that 4 stroke of the piston, the crankshaft will have turned 2 revolutions.

The 4 strokes of the piston is to complete 4 stages of the combustion cycle. As you might have known, in order for a fire (or explosion) to occur to power the engine, we need a fuel, a heat source, and oxygen coming together at the same time.

At the start of the cycle, air must be introduced into the combustion space inside the cylinder. In the 4-stroke (also called 4-cycle) engine, this is the air intake stroke. The piston moving down will suck fresh air into the cylinder through the air inlet valve(s) that is opened.

The next stroke is the compression stroke. With all the valves at the cylinder head closed, the piston moves up again. The air becomes compressed to a very high degree. So high that the temperature of the air becomes sufficiently hot to ignite a finely sprayed fuel mist on contact.

What Do You Mean by Four Stroke?

That is precisely what happens. Before the piston reaches the top-dead center (the maximum height the piston can reach before coming down again), the fuel is injected as a very fine mist into combustion space at the piston top. In order for this fuel to be injected into the highly compressed air inside the cylinder the fuel itself must be at a higher pressure. This is achieved by a fuel pump.

There is a reason for injecting the fuel slightly before the piston reaches top dead center. The fuel takes some time to reach the temperature that it can burn. So the timing of the injection of the fuel is adjusted so that by the time the piston reaches

slightly beyond the top dead center, the fuel has acquired the temperature high enough for ignition.

The fuel is supposed to burn so fast as to explode. So there is no point in injecting it more than it can burn. If the fuel is not able to catch fire, it will remain in the piston as unburnt fuel.

So the timing of the fuel injection will stop slightly after the piston has reached top dead center.

The explosion inside the piston is the driving force for the engine. It will create the momentum to turn the engine for the next 2 cycles.

The next cycle is the exhaust stroke. In this stroke, all the products of combustion is driven off from the piston top. The exhaust valve(s) will have opened to allow the combustion gases to escape. In an ideal engine, these include carbon dioxide gas, water vapor and excess air.

However, in actual practice, the combustion may not be so perfect. Carbon particles, unburnt fuel particles, lubricating oil particles, sulphur dioxide, carbon monoxide, and ash may also be discharged. As the piston will not be able to reach the the cylinder head perfectly, not all the exhaust gas can be driven off completely. A small quantity of these exhaust products will remain inside the cylinder even as the next cycle starts.

Once the exhaust gases have been driven off, the next stroke starts. This is the air intake stroke that we started off with. The cycles repeat itself as the engine runs continuously.

What Do You Mean by Four Stroke?

Obviously the more the exhaust gas can be driven off, and the more oxygen content the cylinder can contain, the more efficient the combustion of the fuel can be achieved.

This can be achieved by supercharging and cooling the air intake.

Well folks, that should boost up your power!

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Two and Four Stroke Engines: Fast and Simple Answers.

By Daniel Levy

A few fast responses and facts about Two and Four Stroke Engines.

Many years ago when I got hooked by motorcycles, I started to hear a lot about two and four stroke engines... It seemed there were (and there still are) strong opinions in pro and con of each of the engine types.

As Internet wasn't available, and as I was worried about other aspects of motorcycle riding back then, I left that question unanswered for a long time.

If this is your case or if you are interested in these two kind of internal combustion engines, in the next few lines I hope to give you a few fast answers and some resources to get more in depth information.

Just keep reading...

What Do You Mean by Four Stroke?

Here are some facts about two and four stroke engines:

TWO STROKE ENGINES

Cycle – Two Strokes: Compression (intake+compression) Combustion (combustion+exhaust)

Take a look at the cycle in:

<http://science.howstuffworks.com/two-stroke2.htm>

Advantages of two stroke engines: The engine fires – spark plug ignites – once every revolution of the crankshaft. They produce twice the power than four stroke engines. They are much simpler than four stroke engines. Fewer parts to worry about.

Disadvantages: You have to mix two stroke engine oil with gas, and depending on your consumption, this might be expensive. They last less. Lubrication is not as efficient as in a four stroke engine with heavy oil. Do not use gas efficiently. Pollute more.

FOUR STROKE ENGINES

Cycle – Four Strokes: Intake Compression Combustion Exhaust

Take a look at the cycle in:

<http://science.howstuffworks.com/engine4.htm>

Advantages of four stroke engines: Last longer than two stroke engines More efficient use of gas
Pollute less than two stroke engines

Disadvantages: More complicated. Many more parts to worry about. Half as powerful as two stroke engines (for equivalent engines) Fires once every two revolutions.

If you want to learn more about two stroke and four stroke engines, take a look at the pages I mention above. You will find extensive information and diagrams that will solve all of your doubts.

Well I hope this gave you some basic information and helped you answer some FAQ about two and four stroke engines! :-)

Enjoy the ride!

Daniel Levy

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What Do You Mean by Four Stroke?

. He loves

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