

Therefore, the diameter of camshaft gear must be double of crankshaft gear or in other words, the no. of teeth of camshaft gear is double the no. of teeth of crankshaft gear. e.g, if no. of teeth of crankshaft gear are 40, then camshaft gear must have 80 teeth.

TWO-STROKE ENGINE

In two stroke engine or two stroke cycle engine, there are only two strokes. As in four stroke engine, there is intake stroke, compression stroke, power stroke and exhaust stroke. But in two stroke engine, the intake & compression strokes are combined while the power & exhaust strokes are combined. So it means that in this type of engine, it sucks the fresh air & fuel mixture and at the same time it compresses the mixture in one stroke, while in the second stroke it produces power and at the same time it pushes out the burnt air mixture out of the cylinder. Thus two stroke engine produces a power stroke at every two piston strokes or at every crankshaft rotation. A two stroke engine is shown in figure.

SCAVENGE

that slightly contain

Let the piston is at B.D.C. As it moves up it opens the exhaust port and transfer port, when it is still moving up a partial vacuum (-ve pressure) is created in the crankcase. So fresh air-fuel mixture comes from the carburetor into the crankcase. This process continues till the piston reaches the T.D.C. i.e. the suction of the air-fuel mixture stops, when piston reaches T.D.C. At the same time the fresh air-fuel mixture in the cylinder is compressed. The spark plug produces the spark which ignites the fresh air-fuel mixture and combustion occurs inside the cylinder and power is generated, which pushes the piston down on the power stroke. During the power stroke as the piston moves down first the exhaust port becomes uncovered (open) while the transfer port is still covered (closed) by the piston. As there is a very high pressure inside the cylinder and the exhaust port is open, so this high pressure pushes the burnt air-fuel mixture out of the cylinder through exhaust port. When the piston further moves down it uncovers the transfer port due to which compressed air-fuel mixture in the crankcase (which is compressed by the piston as it moves down in the cylinder during power stroke) goes into the cylinder. Then this whole process is continued in the same manner again for the other cycle.

SCAVANGING

"The process of explosion of burnt gases and the entering of fresh air-fuel mixture is known as scavanging."

The scavanging in two stroke engine is different than that of four cycle engine. The slope of two stroke engine is slightly different, it is somewhat pear-shaped. It do not contain camshaft, push rod, rocker arm and valves. Instead of these have three ports i.e. Exhaust port, Intake port & Transfer port.

* The cycle of two stroke is completed in one revolution of crankshaft while in four stroke engine cycle is completed in two revolutions of crankshaft. So it means that two stroke engines provide more power as compared to four stroke engines.

* As two stroke engine produce more power as compare to four stroke engine, so its weight to power ratio is less while its power to weight ratio is more.

* As there are less moving parts in two stroke engines, so it is easy to maintain it. i.e. it has less maintainance.

* It may accelerate rapidly. i.e. it have more pop (pick).

* In two stroke engine, the turning moment of crankshaft is uniform that's why we need a light fly wheel.

* The work required to overcome the friction of the exhaust and suction strokes is saved.

* The scavenging is more complete in low-speed engines as it does not leave the clearance volume full of burnt gases as in the four stroke engine.

DISADVANTAGES OF TWO-STROKE ENGINE

It has the following disadvantages:-

- * It is using more lubricating oil.
- * It produce more noise as compared to four stroke engine.
- * It produces chemical pollution.
- * It uses more fuel as compared to four stroke engine.
- * In two stroke engine, frequent cleaning of spark plugs are required as there is more carbon deposition on them.
- * Its volumetric efficiency is less becoz the air-fuel mixture has less time to move into the cylinder.

fuel
partial
fresh
ignition
es the
exhaust
it
compressed
the
mixing
does not
crankshaft
ating oil
oil part
circulate
ts of
mixture
ly fresh
with
(blast)

DIFFERENCES B/W TWO-STROKE CYCLE ENGINE & FOUR-STROKE CYCLE ENGINE

FOUR-STROKE CYCLE ENGINE

In four-stroke cycle engine, the cycle is completed in two revolutions of the crankshaft.

In four-stroke cycle engine, the intake & exhaust valves are opened & closed by valve train, i.e. camshaft, valve lifter, push rod, rocker arms and floating valves with return valves spring.

In four-strokes (Intake, Compression, power & exhaust), there is only one power stroke. Rest of three strokes are the helping strokes.

In four-stroke cycle engine, the air-fuel mixture is drawn directly into the cylinders.

In four-stroke cycle engine, the mixture is directly compressed into the combustion chamber. When the mixture is ignited, the whole power is transmitted to the crankshaft via connecting rod.

TWO-STROKE CYCLE ENGINE

In two-stroke cycle engine, cycle is completed in one revolution of the crankshaft.

There is no Valve train in stroke cycle engine. Instead of intake & exhaust valves, the reed or rotary valve are used. In short, the whole valve train is neglected or eliminated. The engine size will be compact & the machinery costs will be reduced.

In two-stroke cycle engine, every motion of the piston is the power stroke. Hence rpm will be increased, which is an advantage of the two-stroke cycle engine.

In two-stroke cycle engine, the mixture is drawn into the crankcase in the suction stroke. During the downward motion of the piston, the mixture is compressed in the crankcase. Then it rushes into the cylinder.

In two-stroke cycle engine, some power is used or lost by compressing the air-fuel mixture in the crankcase. So the efficiency of power production will be less. Compared to a comparable size of four-stroke cycle engine, this is a disadvantage of the two-stroke cycle engine.

performance will be less

The lubrication oil is

Disadvantages

Petrol engine

air-fuel

powerful

is spacious

There are

of the

motor

voltage

according

exact

In petrol engine

When the exhaust stroke is performed; only the exhaust valve will be opened and intake valve will be closed.

When the downward stroke is performed, both the openings (ports) i.e. the intake & exhaust ports will be opened at a time. So some %age of unburned gases will also exit this event. This is a disadvantage of the two-stroke cycle engine.

engine, the revolution

There is a separate, pressurized train in lubrication system (Pump is used). Lubricating oil is not mixed with the gasoline.

In two-stroke cycle engine, oil is mixed with the gasoline for lubrication purposes.

valve
valve train
size will
it to reduce

DIFFERENCES B/W PETROL & DIESEL ENGINES

PETROL ENGINE

DIESEL ENGINE

advantage
the mixture
the injection
of the piston
crankcase

Petrol engines are the spark ignition engines becoz the compressed fuel is ignited by a spark at the exact time. spark is produced by the injection system.

The diesel engines are called the compression ignition engines becoz the only air is compressed in the combustion chamber. On the compressed heated air, fuel (diesel) is sprayed on the heated (compressed) air by an injector, at the exact time. So the ignition is accomplished by compression.

There are spark plugs fitted on the top of the combustion chambers. The distributor is used to distribute the voltage spark to every cylinder according to engine firing order at exact time.

Injectors (atomizers) are fitted on the top of the combustion chambers. High pressure fuel is distributed by the injection pump to every cylinder according to the engine firing order at the exact time.

In petrol engines, the compression ratio is lower.

In diesel engines, the compression ratio is higher.

Some %
the
case. So the
less a
of fuel
advantage
give.