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Two Stroke Petrol Engine

PH0486

Instruction Manual

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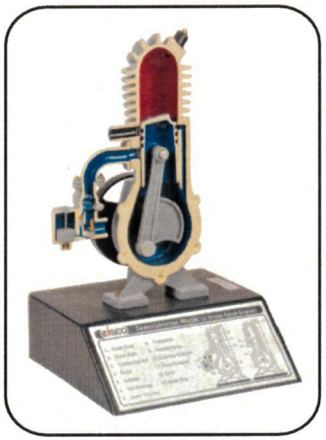
Introduction:



In four stroke engines we have two unproductive strokes, the suction stroke and the exhaust stroke. If suction and exhaust stroke can be served by an alternative method, especially without the movement of the piston then there will be a power stroke for each revolution of the crankshaft. In such an arrangement theoretically the power output of the engine can be doubled for the same speed as compared to four stroke engine. Based on this concept DUGALD CLARK (1878) invented the two stroke engine.

The basic difference between two stroke and four stroke engine is the method of filling the cylinder with fresh charge and removing the burned gases from the cylinder. In two stroke engine suction is accomplished by air compressed in crankcase. The induction of compressed air removes the product of combustion through exhaust ports. Only two piston strokes are required to complete the cycle, one for compressing the fresh charge and the other expansion stroke.

Working:

The figure shows the most common type of two stroke petrol engine. Fuel air mixture is inducted through spring loaded inlet valve when the pressure in the crankcase reduces due to the upward motion of the piston during the compression stroke. Carburetors is essential in case of petrol engine to provide the necessary fuel air mixture under all conditions and at all speeds. At the end of the compression stroke the mixture is ignited with the help of a spark plug located on the cylinder head. During the expansion stroke the air in the crankcase is compressed. Near the end of the expansion stroke piston uncovers the exhaust ports and the cylinder pressure drops to atmospheric as the combustion product leave the cylinder.

The top of the piston usually has a projection to deflect the fresh air to sweep up to the top of the cylinder before flowing to the exhaust port.

The two stroke petrol engine suffers from two disadvantages, fuel loss and idling difficulty. If the fuel is supplied to the cylinder after the exhaust ports are closed, there will be no loss of fuel and the indicated thermal efficiency of the two stroke engine will be as good as that of four stroke engine. To avoid the fuel loss fuel injection just before the exhaust port closure may be used instead of a carburetor.

Advantages of Two Stroke Engine:

Power developed is nearly twice that of the pour stroke engine operating at same speed.

Two stroke engines are lighter than four stroke engines.

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

Disadvantages of Two Stroke Engine:

High speed two stroke engines are less efficient due to reduced volumetric efficiency.

Two stroke engines are liable to cause a heavier consumption of lubricating oil.

Uses:

Small two stroke petrol engines are used where simplicity and low cost of prime movers are the main considerations. In such application a little higher fuel consumption is acceptable. The smallest engines are used in mopeds and lawn movers. Scooters and motor cycles the commonly used two wheelers have generally 100-150cc two stroke gasoline engines developing a maximum brake power of about 5kw at 5500 rpm.