WORKING OF A TWO-STROKE PETROL ENGINE

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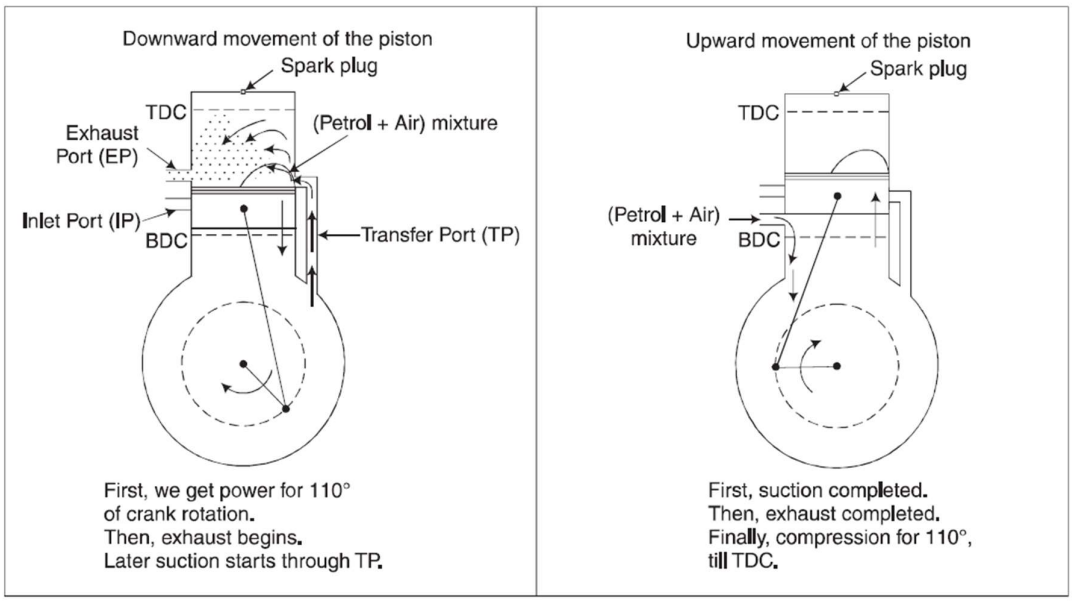
In a two-stroke petrol engine, the cylinder is provided with the inlet port, the transfer port and the exhaust port.

These ports are opened and closed by the movement of the piston itself. The exhaust port as shown in Fig. 11.4 (a), is located slightly above the transfer port.

Let us study the condition when the piston is at TDC. In this position, only the inlet port is kept opened and the other two ports are closed. The mixture of air and petrol is drawn into the crank case due to the vacuum produced by the previous upward movement of the piston. Also, the mixture of air and petrol above the piston is compressed. The compression ratio for a petrol engine varies from 7-10.

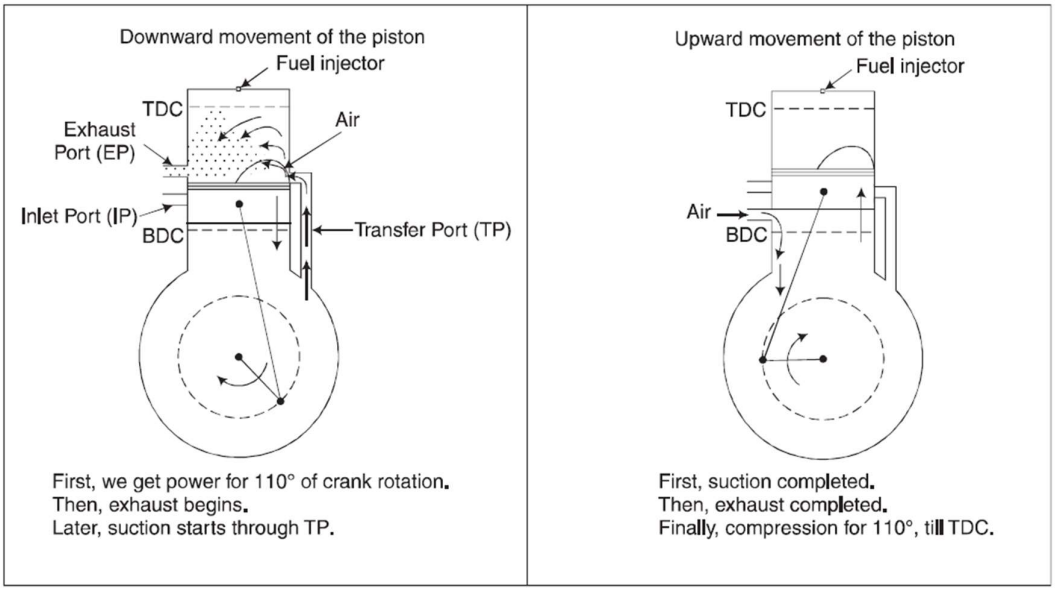
When the spark occurs, the combustion starts and the piston is pushed down due to the pressure created. During its downward motion, the inlet port also is closed due to which the mixture will get compressed inside the crank case. At about 70° from BDC the exhaust port is opened (Note: the beginning of exhaust) and the gases are sent to the atmosphere. At about 60° from BDC, the transfer port is opened (Note: the beginning of 'transfer of charge' into the cylinder) and due to which the mixture from the crank case enters the cylinder. Refer to the port timing diagram in Fig. 11.4(b)



(a)

Fig. 11.4(a) *2-stroke cycle petrol engine*

WORKING OF A TWO-STROKE DIESEL ENGINE



(b)

Fig. 11.4(b) *2-stroke cycle diesel engine*

DIFFERENCES BETWEEN A 4-STROKE AND A 2-STROKE ENGINE

	4-stroke engine	*2-stroke engine*
1.	One working stroke for every 4 strokes or 2 revolutions.	One working stroke for every 2 strokes or one revolution.
2.	As the number of cycles is less, power output is less for the same cylinder size.	Power is more for the same cylinder size. More suitable for a diesel power plant.
3.	The weight of the engine is more for the same output power.	The weight of the engine is considerably less. So, it is more suitable for a marine engine.
4.	Operating temperature is less. So, less consumption of lubricating oil.	Operating temperature is more. So, more consumption of lubricating oil. Special piston cooling is necessary in large engines.
5.	Variation of torque is more. So, heavier flywheel in necessary.	Smaller flywheel is enough as the torque is more uniform.
6.	Noise is less.	Noise is more due to frequent exhaust.
7.	Higher thermal efficiency.	Thermal efficiency is less due to possible wastage of fuel–air mixture through the exhaust port.
8.	Due to a valve mechanism, the design and manufacture of the engine is difficult and cost is more.	Easier in design and the manufacturing cost is less.
9.	Straight piston is used.	Deflector piston is used.