

-29- (3) 2-Stroke Engine Operation Overview

Engines include 2-stroke engines and 4-stroke engines, and the operating states of the two are significantly different. In other words, in a 2-stroke engine, the operations of compression and expansion are repeated, and the fuel explodes and expands every time the piston makes one reciprocation, so the power is transmitted with the crank shaft making a work stroke every revolution. As shown in Figure 2-5, the structure does not have intake or exhaust valves, but has an intake port and an exhaust port at the bottom of the cylinder (near the bottom dead center of the piston stroke), and the piston also functions as a valve to perform intake and exhaust actions. The outline of the action is as follows.

(A) When cylinder compression (piston upward stroke) is completed, fuel is injected and ignited at the same time, so combustion occurs and the piston is pushed down. (Combustion stroke or work stroke)

(B) As the piston descends, the exhaust port on the lower side of the cylinder opens and the combustion gas escapes.

(C) As the piston descends further due to the rotation of the crank, the intake port opens, and the air sent by a separate pump enters the cylinder, completely discharging the remaining exhaust gas, and compression of the air begins in the next upward stroke. In this way, the explosion stroke of a 2-stroke engine is performed twice compared to a 4-stroke engine, so theoretically the output should be twice as high, but in reality it is said to be about 1.5 times.

Exhaust port Intake port (D)

[Diagram] Expansion Compression Exhaust open Intake open Exhaust closed Intake closed
Indicated pressure diagram Crank circle α (Exhaust/Intake)

Figure 2-5: Operation of a 2-Stroke Engine

4. Internal Combustion Engine Terminology

(1) Compression Ratio

The compression ratio indicates the ratio of how much the air or air-fuel mixture sucked into the cylinder has been compressed. The stroke volume when the piston moves from bottom dead center to top dead center is represented by A, and the piston head when the piston reaches top dead center

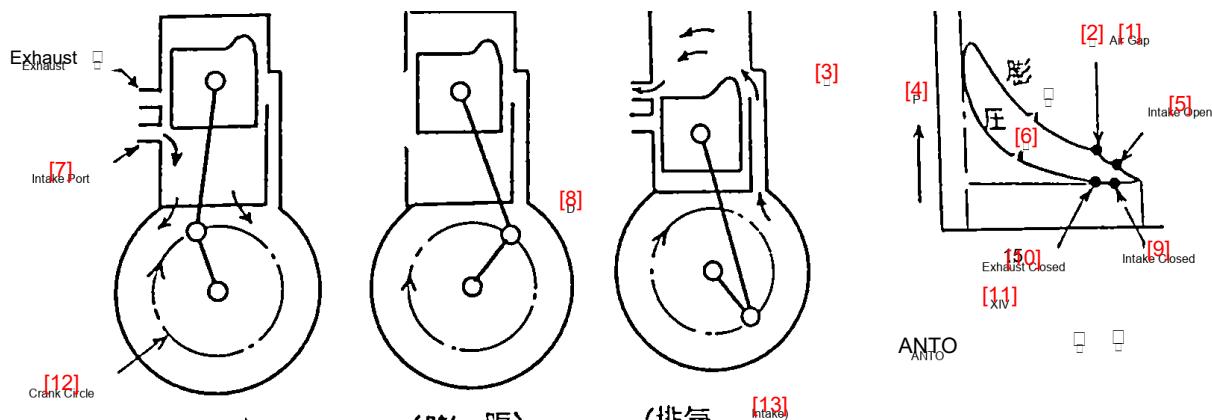


Diagram Key:

- [1] Air Gap
- [2] □
- [3] □
- [4] P
- [5] Intake Open
- [6] □
- [7] Intake Port
- [8] D
- [9] Intake Closed
- [10] Exhaust Closed
- [11] XIV
- [12] Crank Circle
- [13] Intake)

上相比例は、シリソクアリバシハセキナムヘテシテ
Proportion Show Material Piston [1] Move to the point.
Process Volume A Expression Piston Reached Piston Head
[1] (No content to translate)

Diagram Key:

- [1] (No content to translate)