

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

Engines include 2-stroke engines and 4-stroke engines, and their operating states differ greatly. In other words, in a 2-stroke engine, the operations of compression and expansion are repeated, and fuel explosion and expansion occur every time the piston makes one reciprocation, so the power stroke occurs every rotation of the crankshaft, and power is transmitted. As shown in Figure 2-5, the structure does not include an intake valve or exhaust valve, but instead has an intake port and an exhaust port at the lower part of the cylinder (near the bottom dead center of the piston stroke). The piston also acts as a valve, performing intake and exhaust actions. The outline of the action is as follows.

- (A) When the cylinder compression (piston upward stroke) is completed, fuel is injected and ignited simultaneously, so combustion occurs and the piston is pushed down (combustion stroke or power 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 scavenging the remaining exhaust gas. Then, the compression of air begins in the next upward stroke. In this way, since the explosion stroke occurs twice in a 2-stroke engine compared to a 4-stroke engine, the output should theoretically be twice as high, but in reality it is said to be about 1.5 times as high.

Exhaust port Intake port

(D) Expansion Compression Intake Open Exhaust Open Exhaust Closed Intake Closed

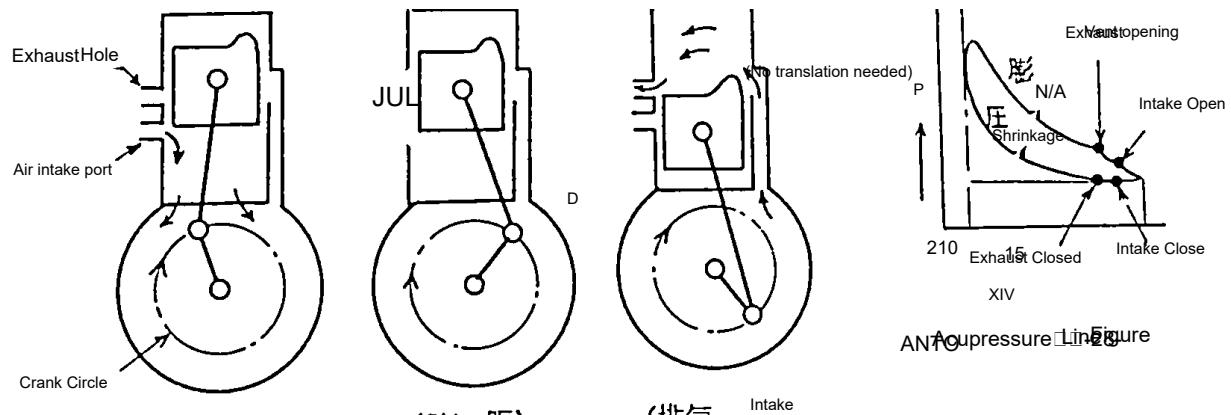
Indicated Pressure Diagram Crank Circle  $\alpha$  (Exhaust/Intake)

Figure 2-5 Operation of 2-Stroke Engine

### 4 Internal Combustion Engine Terminology

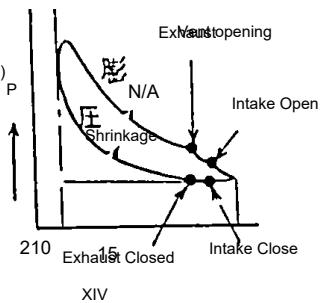
#### (1) Compression Ratio

The compression ratio indicates how much the air or air-fuel mixture drawn 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 volume of the piston head when the piston reaches top dead center



AN10upressure Line Figure

上部圧力線図、シリノクドリーブスバルブ、シリンダーヘッド  
 Ratio Show Material Piston No text Point  
 Expression Piston Point Reaching Time Piston Head  
 Process  
 No translation needed.



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