-28- and becomes high temperature above the ignition point of the fuel.

(C) Combustion Stroke (See Figure 2-3) With the intake valve S and exhaust valve E closed, the high-pressure fuel, atomized by the fuel injector, is injected from just before the end of the compression stroke, i.e., just before the crank reaches top dead center, to the beginning of this stroke, and spontaneously ignites upon contact with the high-temperature air. The fuel undergoes explosive combustion within the cylinder, and the rapid expansion force of the combustion gas pushes the piston down, which, via the connecting rod, becomes the rotational force of the crankshaft. This stroke is called the combustion stroke or power stroke.

(D) Exhaust Stroke (See Figure 2-3 (1)) With the exhaust valve E open, as the piston rises past bottom dead center, it exhausts the combustion gas into the atmosphere and completes the exhaust process when it reaches top dead center. In the combustion stroke, just before the piston (P) reaches bottom dead center of the crank, the cam opens.

[Diagram of Engine Stroke] (A) Intake stroke (B) Compression stroke P: Piston V1: Volume 1 V2: Volume 2 P1: Pressure 1 P2: Pressure 2

Figure 2-4: Indicator Diagram of a 4-Stroke Engine

As described above, the crankshaft rotates twice during the piston's (P) four strokes (two reciprocations), and the power stroke during this period occurs only once.

Figure 2-4 shows the indicator diagram (PV diagram) of a 4-stroke engine. It represents the state change of the gas inside the cylinder when gas is introduced into the cylinder and the piston is pushed from position A to position B, or conversely, when the piston is pushed from position B to position A by the expansion force of the gas. Generally, the pressure is represented by P on the vertical axis, and the volume is represented by V on the horizontal axis, and the relationship between the two (change in gas volume and pressure inside the cylinder) is shown in the diagram.

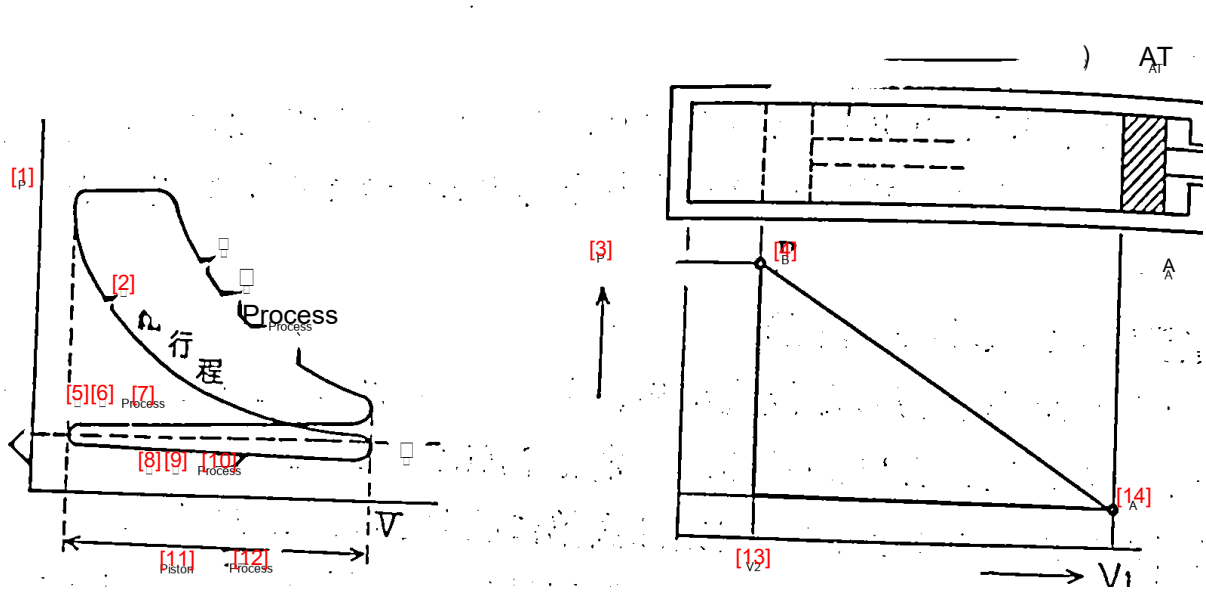

Diagram Key:

[1] P
[2] □
[3] P
[4] B
[5] □
[6] □
[7] Process
[8] □
[9] □
[10] Process
[11] Piston
[12] Process
[13] V2
[14] A

If the volume when pushed in is V2 and its pressure is represented by P2, that is, if the volume when the piston is at A is V1 and the pressure is P1, then the diagram is called a PV diagram or indicator diagram.

Diagram Key:

[1] □
[2] Acupressure
[3] □
[4] □
[5] referred to as

[6] □
[7] From
[8] (No text provided)
[9] □
[10] □
[11] To express
[12] This
[13] □
[14] □
[15] □