-28- The temperature becomes high enough to exceed the ignition point of the fuel.

(C) Combustion Stroke (See Figure 2-3)

With the intake valve S and exhaust valve E closed, as the piston (P) approaches the end of the compression stroke, i.e., slightly before the crank reaches top dead center, high-pressure fuel is injected in a mist form by the fuel injector. This fuel ignites spontaneously 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 opened, as the piston rises past bottom dead center, combustion gas is discharged into the atmosphere, completing the exhaust process when the piston reaches top dead center.

[Diagram of 4-Stroke Engine Indicator Diagram]

(A) (B) Exhaust Stroke Intake Stroke Piston Stroke Stop

Figure 2-4: 4-Stroke Engine Indicator Diagram

As described above, the crankshaft makes two rotations during the 4 strokes (2 reciprocations) of the piston (P), and the power stroke occurs only once during this period.

Figure 2-4 shows the indicator diagram (PV diagram) of a 4-stroke engine. This diagram illustrates 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 A by the expansion force of the gas. Generally, the pressure is represented by P on the vertical axis and the volume by V on the horizontal axis, showing the relationship (change in gas volume and pressure inside the cylinder) in a diagram.