

-28- ...resulting in a high temperature exceeding the fuel's ignition point.

(C) Combustion Stroke (See Figure 2-3) With the intake valve S and exhaust valve E closed, fuel, pressurized by the fuel injector into a mist, is injected from just before the end of the compression stroke (i.e., when the crank reaches top dead center) to the beginning of this stroke. Upon contact with the hot air, it spontaneously ignites. The fuel undergoes explosive combustion within the cylinder, and the rapid expansive 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.

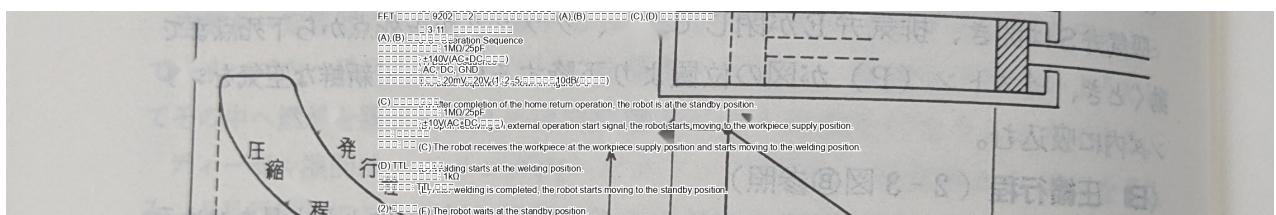
(D) Exhaust Stroke (See Figure 2-3 (1)) With the exhaust valve E open, as the piston rises past bottom dead center, the combustion gas is discharged into the atmosphere, completing the exhaust when the piston reaches top dead center.

[Diagram: Likely labels indicating Intake stroke, Exhaust stroke, Piston (P), Spark, etc. Refer to original image for accurate interpretation.]

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

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

Figure 2-4 shows the indicator diagram (PV diagram) of a 4-stroke engine. It illustrates the change in the state of the gas within 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 expansive 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. The diagram shows the relationship between the two (the change in gas volume and pressure within the cylinder).



If the volume when the piston is at A is V_1 and the pressure is P_1 , then when at B, the compressed volume becomes V_2 , and its pressure is represented by P_2 . This diagram is called a PV diagram or indicator diagram.