-28- This results in a high temperature exceeding the ignition point of the fuel.

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

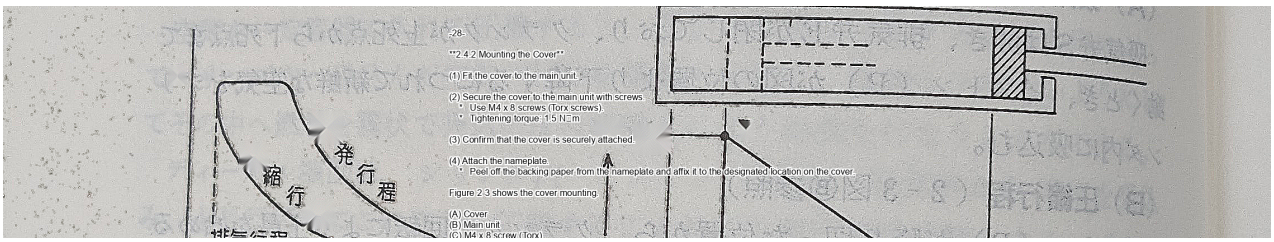
With the intake valve S and the exhaust valve E closed, fuel, pressurized by the fuel injector into a mist, is injected from just before the end of the compression stroke, i.e., just before the crank reaches top dead center, to the beginning of this stroke, and it ignites spontaneously upon contact with 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 becomes the rotational force of the crankshaft via the connecting rod. This stroke is called the combustion stroke or power stroke.

(D) Exhaust Stroke (See Figure 2-3 (1))

If the exhaust valve E is opened, the combustion gas is discharged into the atmosphere as the piston rises past bottom dead center, and is completely exhausted when the piston reaches top dead center.

[Diagram of 4-stroke engine cycle] BOS) ATR (A) a P Explosion PP2 B Exhaust Stroke Intake Stroke P1 V2 (1) SA →V1 Piston Stroke Stopped

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



As a result, the crankshaft makes 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 represents the state change of the gas inside the cylinder when gas is introduced into the cylinder and the piston is pushed sequentially 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, pressure is represented by P on the vertical axis, and volume is represented by V on the horizontal axis, to illustrate the relationship between the two (change in gas volume and pressure inside the cylinder) in a diagram.

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