-28- becomes a high temperature exceeding the ignition point of the fuel.

(C) Combustion Stroke (See Figure 2-3) With the intake valve S and exhaust valve E closed, from the end of the compression stroke of the piston (P), that is, from just before the crank reaches top dead center, to the beginning of this stroke, high-pressure fuel is injected in an atomized state by the fuel injector, and it comes into contact with the high-temperature air and spontaneously ignites. The fuel undergoes explosive combustion in 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, as the piston rises past bottom dead center, it exhausts the combustion gas into the atmosphere, completing the exhaust when it reaches top dead center. In the combustion stroke, just before the piston (P) reaches the bottom dead center of the crank, the cam opens.

[Diagram: Figure 2-4 4-Stroke Engine Indicator Diagram]

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

Figure 2-4 shows the indicator diagram (PV diagram) of a 4-stroke engine, which represents the state change of the gas inside the cylinder when the gas is introduced into the cylinder and the piston is sequentially pushed in 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. In general, 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 (the change in gas volume and pressure inside the cylinder) is represented in a diagram.

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 at B, this diagram is called a PV diagram or indicator diagram.

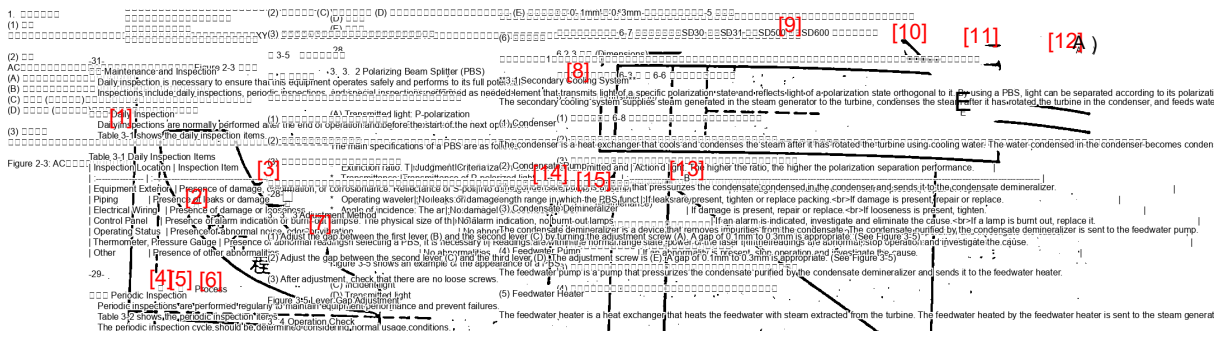


Diagram Key:

[1] P

[2] □

[3] □
[4] □
[5] □
[6] Process
[7] Process
[8] -28-□□1. □□□□□□□□(1) □□□□□□□□