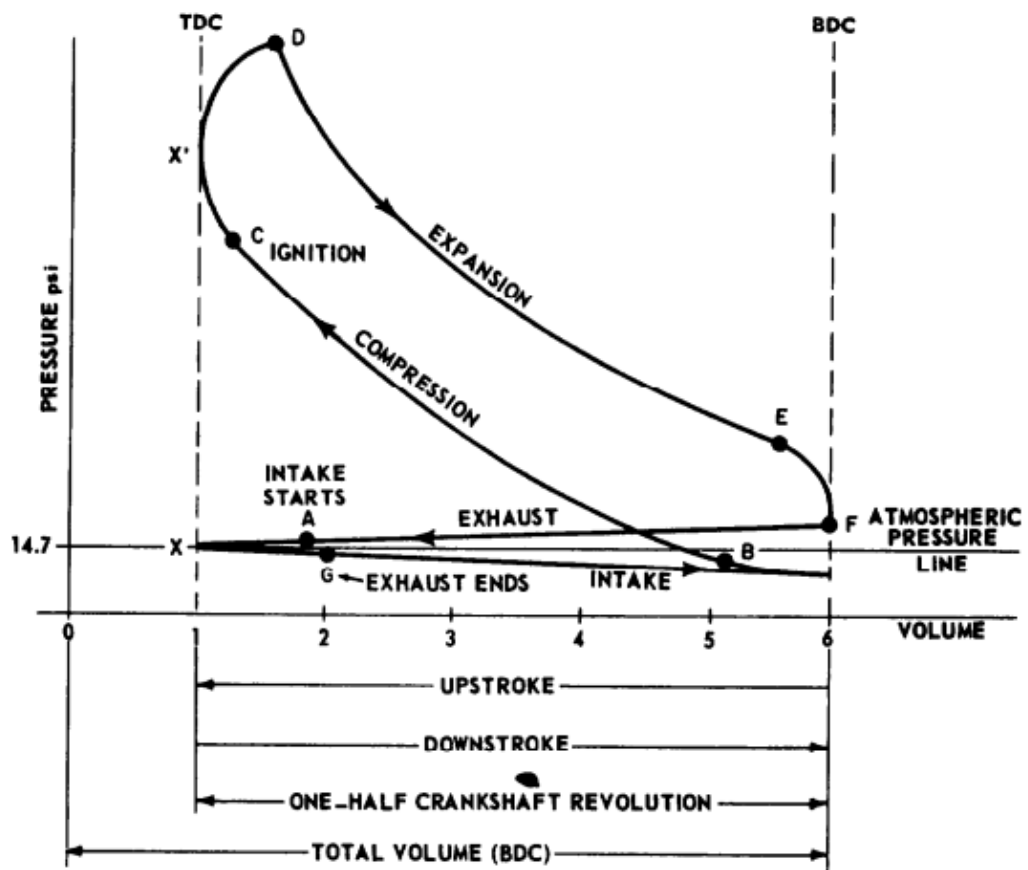
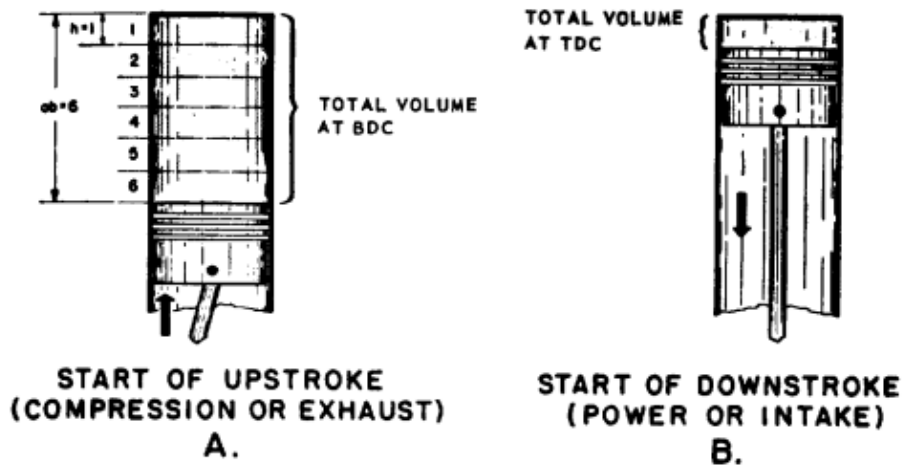


From Engineman 3<sup>rd</sup> Class Nonresident navy training course (NAVEDTRA 14331) with unlimited distribution.



C-CYCLE DIAGRAM  
C.

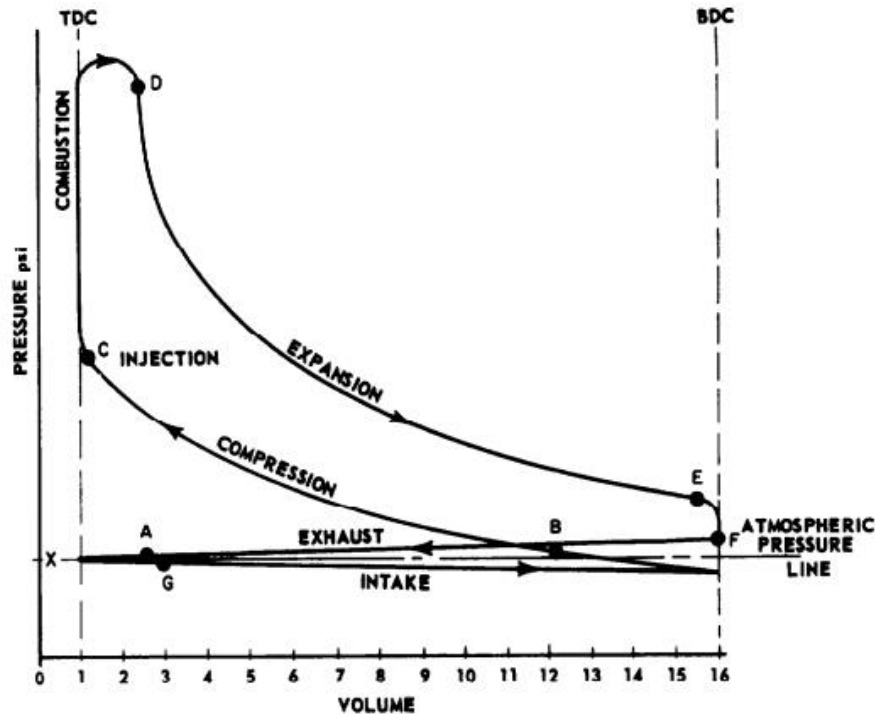


Figure 2-7.—Pressure-volume diagram for a diesel 4-stroke cycle.

54.19C

piston on BDC at the start of an upstroke. (In a 4-stroke cycle engine, this stroke could be identified as either the compression stroke or the exhaust stroke.) Study views A and B of figure 2-6. Notice that in moving from BDC to TDC (view B), the piston travels five-sixths of the total distance AB. In other words, the VOLUME has been decreased to one-sixth of the volume when the piston was BDC. Thus, the compression ratio is 6:1.

View C of figure 2-6 shows the changes in volume and pressure during one complete 4-stroke cycle. Notice that lines representing the COMBUSTION and EXHAUST phases are not as straight as they were in the theoretical diagram. The vertical line at the left represents cylinder pressure in pounds per square inch (psi). Atmospheric pressure is represented by a horizontal line called the ATMOSPHERIC PRESSURE LINE. Pressures below this line are less than atmospheric pressure, while pressures above the line are more than atmospheric. The

bottom horizontal line represents cylinder volume and piston movement. The volume line is divided into six parts that correspond to the divisions of volume shown in view A. Since piston movement and volume are proportional, the distance between 0 and 6 indicates the volume when the piston was at BDC, and the distance from 0 to 1 indicates the volume with the piston at TDC. Thus, the distance from 1 to 6 corresponds to total piston travel with the numbers in between identifying changes in volume that result from the reciprocating motion of the piston. The curved lines in view C of figure 2-6 represent the changes of both pressure and volume that take place during the four piston strokes of the cycle.

To make it easier for you to compare the discussion on the relationship of strokes and events in the diesel 4-stroke cycle (fig. 2-1) with the discussion on the Otto 4-stroke cycle (fig. 2-6), we will begin the cycle of operation at the INTAKE. (Refer to fig. 2-6.) In the Otto cycle, the INTAKE event includes the admission of fuel and