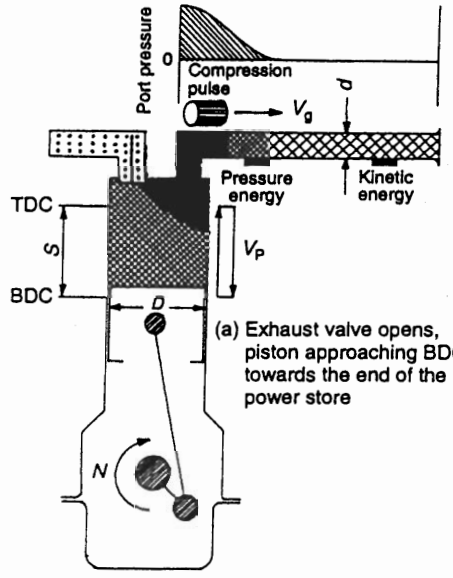
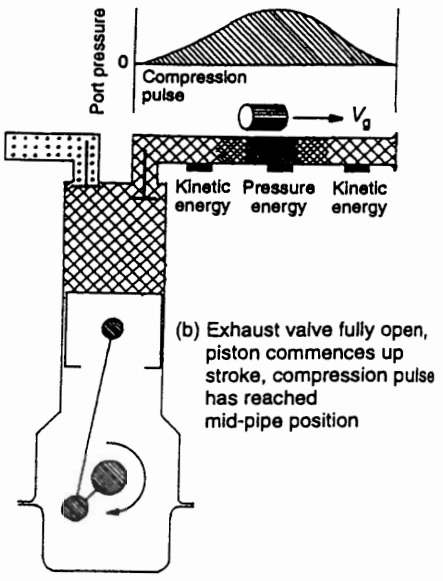
a 1¾- to 1⅞-inch primary pipe, which translates to an exhaust system with 3.50- to 3.75-inch-diameter pipes.

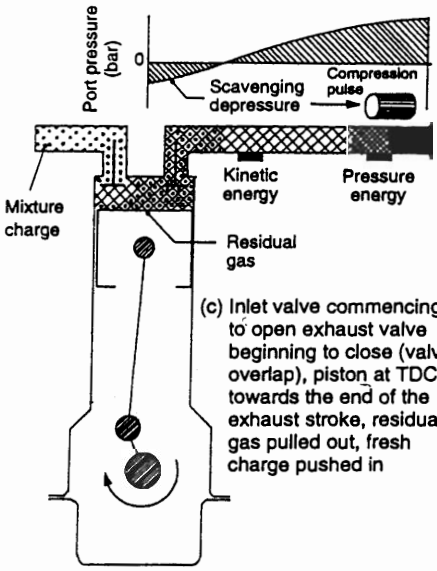
Mufflers and Crossover Pipes

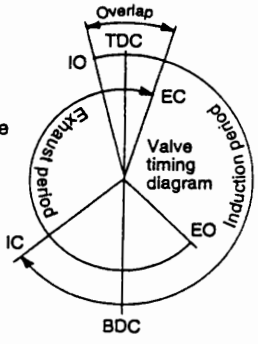
In nearly every street application, a balance tube or crossover pipe just downstream of the connection at the collector or exhaust manifold will improve power when a full-length system is employed. The crossover tube masks the variation in primary pipe length and in the pressure differentials, the frictional losses through bends and exit angles, along with the firing cycle of a V-8 with an offset crankshaft. In an open-header race configuration the engine becomes two four-cylinder units, so the balance tube serves no purpose. The best balance tubes are configured in an X-shape, as this has the most efficient point of convergence. Traditional H-shaped balance tubes are easier to package and offer better accessibility to components such as the transmission. Engineers refer to mufflers as "silencers" or "expansion chambers" because most are designed only to cancel noise, but a properly designed muffler will actually improve power. Its purpose is to minimize flow restriction and noise. Recently the NHRA ruled that all Sportsman-series engines be fitted with mufflers to satisfy local noise regulations. Interestingly, many racers discovered that their cars went faster with a properly designed silencer.

Historically, conventional mufflers used varied internal forms to silence the exhaust. A restriction-style was constructed with internal partitions that force the gas through









Cam overlap, intake manifold runner length, and exhaust design all affect how efficiently the spent gas vacates the cylinder bore.