THE EXTRA MILE

Engine Building and Power Techniques

BY SCOTT SEHR

Sehr PERFORMANCE MACHINE

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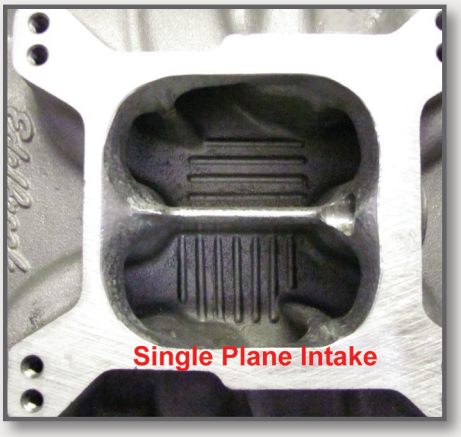
Engine Power Techniques: Intake Manifolds

Last month we discussed volumetric efficiency and carburetor sizes. Now we need to examine the affects that the intake manifold has on the naturally aspirated engine combination. There are countless intakes on the market today, all claiming that the power and torque gains are the best for the particular RPM range that they are built for. However; the intake manifold that will work best for a hot rod engine has more factors to consider than RPM range. Other considerations are single or dual plane, intake height, runner length, intake plenum volume, runner volume, runner shape, cylinder head flow camshaft design and carburetion.



Let's first differentiate between single and dual plane intakes. Dual plane intakes are what you will find on most all passenger car engines. These are designed for a longer runner length and will provide good lower RPM torque. There are aftermarket dual plane intakes that are produced with larger plenum and runner volume and enhanced runner shapes for better flow and power gains. These intakes are a good choice for a street driven hot rod with a good camshaft. Single plane intakes are designed for the higher RPM use and are found on more radically designed engines. These intakes provide less low RPM torque but gains in the higher RPM ranges. There are many different runner heights, shapes and volumes to choose from so finding the right intake for your hot rod is an important step in determining your engines performance.

Most people think that the intake's only job is to guide the flow of the fuel air mixture directly into the head but there is a lot happening inside the intake. During valve overlap in the combustion cycle, up to when the intake valve slaps shut there is a reversion and pressure change in the intake runner. This intake charge will actually move backwards towards the carburetor and be at a standstill for a brief period until the intake valve begins to open again. If an induction system is designed correctly the intake charge will be enhanced in velocity by timing this phenomenon with the correct runner length increasing volumetric efficiency and power.

Intake velocity is another phenomenon to be considered when choosing an intake for your hot rod. The larger the runner size the more volume and the more intake charge it will hold, how quickly this charge moves through the system determines the velocity. Depending on the displacement of the engine, the RPM range it will be operated in and camshaft design, if the runner length is too big the velocity will be too slow and the efficiency and performance suffers. If the intake runner is too small the velocity will be higher but it might not have enough volume to properly fuel the engine.

These are just a few critical things to consider when choosing an intake manifold. Here at Sehr Performance our years of knowledge and experience is put into each of our engines so your hot rod will be powered through to the Extra Mile and beyond.

Let us help you get the
"EXTRA MILE"
out of your next build.

722 E. 8th St. | Sioux Falls, SD | 605-334-4191 | sehrpower.com | sehr@sehrpower.com