

Tuning with Carburetor Spacers

By Sam Moore

Carburetor spacers are valuable tuning aids for both performance cars and racing cars alike. Positioned between the carburetor and the intake manifold, a spacer will alter the relationship between these two components. Consequently, the spacer can usefully raise or lower the position of the torque and power-band within the rpm range. They can also be used to correct inefficiencies in a mismatched combination. Spacers are available in several different forms: 4-hole, open, and combination; they are also made from different materials and in different thicknesses.

4-Hole Spacers. Generally, a 4-hole spacer; that is, one with four holes that align with the four barrels of the carburetor will increase throttle response and acceleration. It can also lower the torque and power-bands within the RPM range. This is accomplished by keeping the columns of air and fuel flowing longer, which increases the air velocity. Adding a 4-hole spacer can be an effective and practical solution for a vehicle with sluggish throttle response or lethargic corner exit speeds. In addition, a 4-hole spacer can also help compensate for an oversized component: a carburetor, camshaft, intake manifold, etc.



By lowering the torque and power bands within the rpm range, the 4-hole Phenolic spacer quickens throttle response.



The open spacer is used to slow the throttle response, making the racecar easier to handle on slick surfaces.

helpful in overcoming traction problems during acceleration or corner exit. Furthermore, an open spacer can also help compensate for an undersized component: a carburetor, camshaft, intake manifold, etc.

Open Spacers. Usually an open spacer; that is, one with a large square-shaped hole beneath the carburetor, will decrease throttle response and dampen acceleration. It can also raise the torque and power-band within the RPM range, which is accomplished by increasing the plenum area. Adding an open spacer can be



Combination Spacers. A combination spacer is distinguished by being part four-holed and part open and

The combination spacer increases throttle response and acceleration and tends to broaden the torque and power band.

can provide the best of both worlds. Choosing a combination spacer increases throttle response and acceleration; it can also increase or broaden the torque and power-band. The four-hole surface of the spacer interfaces with the base of the carburetor.

Plenum Dividers. In an open plenum intake manifold, a plenum divider partitions the plenum from side to side. The divider helps prevent unwanted side to side fuel movement in high G-force oval-track or road-race applications. On certain engines, it is common to have lean cylinders due to fuel surge; for example, a small-block Chevy oval-track engine running on methanol can run lean on cylinders 3 and 5, while cylinders 4 and 6 are rich. By using a plenum divider, equal fuel distribution can be restored to the each cylinder bank.



Spacer thickness. Normally, a thicker spacer increases the effect; that is, if a ½"-thick spacer improves matters, a 2"-thick spacer will further increase the effect. Varying the thickness of a spacer affects engine performance.

By thwarting centrifugal forces, the divider equalizes fuel distribution to all cylinders.

Spacer Material. There are many different types of materials used for the manufacture of spacers, and all have their advantages and disadvantages. Wood, for example, is a poor conductor of heat and therefore thermally efficient. Unfortunately, it can absorb fuel, which is not safe. Plastic or composite spacers are also thermally efficient, but they are not as strong as phenolic or aluminum and can be laborious to modify. Phenolic fiber spacers are popular and resistant to the transfer of heat, but they, too, can be hard to modify. In contrast, aluminum spacers have poor resistance to heat transfer, but they can be ported or modified easily.

Spacer Tuning. Since each spacer will react differently to each engine combination, there is neither a right nor a wrong type. Spacers are valuable tuning tools. They're especially helpful when dialing-in a new combination or when tuning a racecar for varying track conditions. Swapping a spacer is quick and simple, and the change can have significant influence on the drivability of a racecar or streetcar. Possessing spacers of several different types and thicknesses is practical and always a sound investment.