



CARTER AFB SELECTION AND TUNING GUIDELINES

Federal-Mogul Document #1601

SELECTING THE CORRECT CARBURETOR SIZE

The Carter AFB is offered in a range of sizes, from 500CFM to 750CFM. CFM stands for "cubic feet per minute". This is a measure for the amount of air that will flow through the carburetor at wide open throttle while a specified amount of vacuum is maintained below the throttle plate. (Four barrel carburetors are rated at 1-1/2" of vacuum). Each AFB is flexible enough to cover a wide range of engine sizes due to the flow sensing secondary air valves. Even when the secondary throttle plates are open, these air valves will not permit flow through them until the engine is able to handle the additional air and fuel. This prevents "bog" and hesitation during acceleration.

There is no magic formula for determining the correct size carburetor for each application. Different carburetor sizes may produce similar maximum horsepower, but will vary considerably in low speed and midrange performance. These variations will affect vehicle driving performance, particularly in street driven applications. The key is airflow velocity through the carburetor, which produces a vacuum signal to draw fuel through the main boosters. Too large a carburetor will not generate sufficient vacuum to start the main circuit until reaching a high RPM level. When the throttle is open, main circuit fuel flow must begin before the accelerator pump shot is consumed to prevent an engine hesitation or "bog".

Below is a data chart giving the calculated air flow requirements for a number of engine displacements. If you are selecting a carb for street use, be conservative on size. If your vehicle is modified with a high stall speed converter and a 3.90 or greater gearing, it is usually safe to go to a larger size carb. Large displacement engines, or those operating at high RPM, may benefit from a dual quad setup using two lower CFM carbs on an aftermarket intake.

C.I.D.	ENGINE RPM								
	2500	3000	3500	4000	4500	5000	5500	6000	6500
231-239	165	195	230	260	295	325	360	390	425
252-265	180	215	255	290	325	360	400	435	470
267-283	200	240	280	320	360	400	440	475	520
289-307	220	260	305	350	390	435	475	520	565
318-340	235	280	330	375	425	470	520	565	610
348-360	255	305	355	405	455	505	560	610	660
383-390	270	325	380	435	490	545	600	650	705
396-400	290	350	405	460	520	580	635	695	750
409-429	310	370	430	490	555	615	675	740	800
440-460	325	390	455	520	585	650	715	780	845

← CFM →

Warning - Before installing a Carter Competition series AFB carburetor or other performance products, check your state and local laws as installation may not conform to regulations in some areas. Not legal for sale or use in California on pollution controlled motor vehicles. No products listed here are applicable to aircraft usage. Use only those products designated Marine on Marine applications.

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TUNING - JETS, METERING RODS, AND SPRINGS

The Carter AFB, as manufactured, has a universal fuel delivery curve that allows it to perform well on a wide variety of applications. While the AFB will work well if simply "bolted on", the best results are achieved by optimizing the carburetor to the specific engine and vehicle. Federal-Mogul offers all the components needed to fine tune the carb to any application. Carter carburetors are easier to work on, and have more tuning flexibility than do competitive make.

All AFB carburetors have four metering jets. The jets in the secondary side are smaller than those in the primary. The larger primary jets are restricted by metering rods that control the part throttle mixture. Each metering rod has both a large and a small diameter machined step. These steps limit the amount of fuel that flows through the jet. The smaller diameter is at the bottom of the rod, and controls wide open throttle fuel delivery. The upper diameter step limits part throttle fuel flow. The rod is held in a given position within the jet by a calibrated spring, which moves the rod between the steps in response to engine vacuum. Different springs are available, and can be used to alter the enrichment point as a cure for a transitional sag or flat spot, or to compensate for performance camshafts having low manifold vacuum.

Wide open throttle fuel mixture is determined by "reading" the spark plug or by comparing drag strip trap speeds. The mixture is changed by using larger or smaller jets on the secondary side of the carb, and by changes to either the jets or the metering rods on the primary side. Jet changes affect both wide open throttle fuel delivery and part throttle performance, while the metering rods can alter one without significantly affecting the other.

The metering rod design of the AFB lends itself well to the trial and error tuning common to high performance vehicles. Fuel curve recalibration takes only minutes without spilling a drop of fuel, scraping and changing gaskets, or disconnecting fuel lines. Changing the metering rods to ones having a smaller lower diameter and an unchanged upper diameter will richen wide open throttle while retaining the same midrange economy. To do this with other carburetors you will need to remove the float bowls and metering blocks, and drill out the power valve channel restrictions. With the AFB this is done without even taking the top off the carburetor!

All Carter AFB's feature mechanical secondaries, which will guarantee that they open when you floor the gas pedal. To eliminate any bogs or hesitations as the secondaries open, a secondary velocity valve is used. This valve allows airflow through the secondaries in response to engine requirements. The opening rate of this valve can be altered by drilling through the counterweight, but this is rarely necessary. It is also possible to eliminate some secondary bog conditions by removing the small tubes that restrict the "early feed" fuel supplies at the edge of the velocity valve. This modification requires removal of the secondary cluster assemblies, and like drilling the counterweight, it is not usually necessary.

The accelerator pump circuit controls throttle response and off idle acceleration. Too little pump shot will create a flat spot or hesitation, while too much will result in sluggish acceleration and possible black smoke from the exhaust. Federal-Mogul offers a kit with three pump squirters to fine tune this fuel delivery. Additional tuning is done by changing the position of the pump link in the pump arm, and by altering pump stroke. These three adjustments allow you to vary the amount of fuel, the duration of the pump "shot" and the timing of its delivery.

The AFB is manufactured with two .101" diameter needle and seat assemblies. The 10-201 Strip Kit also includes variations with diameters of .111" and .120". While the larger ones offer more total flow potential, they do so at the cost of some fuel control capability. The .111" size is the largest that is practical for normal street use. All AFB's are calibrated for use with 5 PSI fuel pressure.

The Carter AFB is the carb that powered the Hemi and the Dual Quad 409. It will deliver the trouble free power you need, whether you simply bolt it on and go, or decide to "max it out" for ultimate performance.