



## Stromberg 97 and Vacuum Advance.

### Ported, manifold and more. The full discussion.

It's no secret that regular Stromberg 97 carburetors do not provide what we call 'ported vacuum' for a modern vacuum advance distributor. But with the introduction of the new Stromberg 97 Vacuum Port (VP) carburetor option, all that has changed. There are still a lot of questions around the subject through, so let's try and answer some here.

Tech note: 'Ported' vacuum is taken from just above the throttle plate via a small bore line to the distributor vacuum canister. It is designed to provide additional, vacuum-activated timing advance only at light load/part throttle conditions and not at idle or full throttle. Claimed benefits include improved fuel economy, throttle response and drivability. Most aftermarket vacuum advance distributors are designed to work with ported vacuum, though the technical specification should always be checked.

To quote Mallory's Small Block Chevy distributor instruction sheet ... "The vacuum advance will advance the timing up to 10° during partial throttle driving (with 15 lbs of vacuum). The vacuum line should be routed to a ported vacuum outlet above the throttle plates."

The Stromberg Vacuum Port option.

Developed in-house at Stromberg Carburetor, the new vac-port equipped 97s provide ported vacuum through a small brass fitting located just behind the kicker linkage on the same side of the carburetor base (throttle body) as the typical small-block Chevy distributor vacuum canister. The fitting can be replaced with a small set screw (supplied) if engine needs change. The vacuum ported base is optional (with suffix -VP) on the full range of Stromberg 97 carburetors, including the OE finish, Chrome, Black and Barn Find models. And a new replacement base casting (throttle body) is also available, complete with all new throttle shaft and plates, idle needle screws, kicker linkage and choke lever. Available only from Stromberg Carburetor, it's the perfect swap-in for any 97. Multiple 97 applications need only one vac-port equipped carburetor. And ALL new Stromberg BIG (250cfm) 97 Primary models come with a vacuum port as standard.

Genuine Stromberg 97 with vacuum port - Part Number 9510A-VP

New 97 base with vacuum port - Part number 9514-VP

What about my Ford flathead?

On a Ford flathead engine, the early front-mounted distributors (up to 1948) used a vacuum brake (retard) system, driven by intake manifold vacuum, so these engines do not need carburetor vacuum. From 1949 to '53, however, the Ford V8 used the weird and wonderful Load-O-Matic distributor which took vacuum from the Ford 8BA/EAB carburetor. This wasn't simple ported vacuum, though. It was taken from three sources - manifold, ported and venturi vacuum, so you can only use the Load-O-Matic with the correct compatible Ford/Holley carburetor OR the rare Stromberg 97 1-1 model which was produced as an aftermarket swap specially for post '49 Fords. Yes, it does have a vacuum port in the base, and yes it does work with the Load-O-Matic. But no, it doesn't provide what we know as ported vacuum for your regular distributor. Equally, the new Stromberg 97 VP option will not work properly with the Load-O-Matic. As far as we know, all of the currently available aftermarket distributors for Ford flatheads are all-mechanical advance.

I've got a Chevy. What about a distributor with all mechanical advance?

Yes, it is a good possibility. And until recently, this was the only choice folks had. Stromberg 97 customer John W posted on our Facebook page: "On my 350 sbc, I changed my vacuum distributor to a mech advance and total timing to 36 degrees. The difference is staggering. I run a 3 x 97 carb setup and now have no black soot at tickover and clean throttle response right through to bringing in the outer two carbs."

What if I just use a vac advance distributor, but don't connect the vac canister?

Yes, that's another choice. In fact, vacuum distributor equipped engines should be timed with the vacuum line disconnected from the distributor anyway. You wouldn't benefit from the extra torque, drivability and economy you'd get by connecting it to ported vacuum, but it would work.

So is vacuum advance better than all-mechanical then?

Certainly if you're driving your car mainly on the street, we'd say yes. That's why most aftermarket distributors for street use have a vacuum canister - because it gives you that 'best of both worlds' timing that a mechanical-only distributor simply cannot deliver. For example, to test the new VP base on our 350ci Chevy dyno motor, we disconnected the vacuum, locked the throttle at 1800rpm and reconnected it. The additional timing induced by the vacuum raised rpm to 2000 and increased torque by 4 ft-lb - all without adding more gas, of course. The exhaust sound changed considerably, too, so it obviously appreciated the extra timing.

OK, so I'll use the VP carb with a vacuum distributor. How do I tune it?

We have a separate How-To about this subject...It's also on the Stromberg Tech Center.

Can I put manifold vacuum into my vacuum advance distributor?

Well, yes and no, depending on the application and, more importantly, the requirements of your distributor. Some factory distributors (mostly early ones) did run manifold vacuum. When we launched the VP option, Chris Kooney emailed to tell us, for example, that the 1957 Ford dual-advance distributor uses a vacuum source from below the throttle plates (ie. manifold vacuum). And Skip Radio emailed to remind us that small block Chevrolet engines with Kettering (points) ignition came from the factory running manifold vacuum advance - the exception being Corvettes with the factory-equipped xxx891 dual point distributor. Obviously, then, if you have compatible parts and set the timing correctly, your engine will run perfectly well with manifold vacuum advance. But remember that many things have changed dramatically since the 1960's when manifold vacuum was used into a vac advance distributor...cylinder heads, camshafts and fuel quality for a start.

We posed this same question to top carb modifier and Stromberg consultant, Norm Schenck. He said, "My experience with vacuum advance on modern street engines has been that most run better with ported vacuum than with manifold vacuum to the distributor. Whichever you use, if you run a distributor designed for manifold vacuum on ported, the spark will not be timed correctly. And the other way around. Worst of all, do not set static ignition advance with the vacuum advance connected, then disconnect it, as this will make the engine severely retarded...with horrible fuel mileage, black smoke, and heat in the exhaust.

On most hot rod engines, modern vacuum advance distributors are designed for ported vacuum. If you use manifold vacuum with them, it pulls full distributor advance at idle. My 355ci Chevy had a hesitation on the dyno, during the transition to full throttle, with both the 4-barrel and prototype 'BIG 97' carburetors, when the vacuum advance was not hooked up. In the car, with the ported vacuum advance connected, there was no hesitation. With manifold vacuum connected, there was a big off-idle hesitation."

Here's why... When an engine has increased ignition advance at idle (because the vac canister is connected to the manifold), the manifold vacuum actually increases further. This then requires a readjustment of the idle speed and idle mixture to keep them correct. Then, at the instant the throttles are opened, the manifold vacuum drops, and because the vacuum advance depends on that vacuum, the ignition advance also decreases. With manifold vacuum and ignition advance dropping simultaneously, you get a very short period when the fuel/air mixture is too lean... causing a hesitation.

Some guys will richen the idle mixture to prevent a hesitation, but that makes the idle mixture and the steady state (cruising) part throttle mixture too rich as well. You might eliminate the off-idle hesitation, but at some cost to the fuel consumption at idle and cruise. Better to use as much initial ignition advance as the engine wants - to achieve good idle quality - then recurve the distributor for the correct amount of total timing at full throttle, and then use ported vacuum for the vacuum advance to add extra advance for cruising. This approach allows the tuner to prevent off-idle hesitations without having to sacrifice idle mixture, idle quality or cruising mixture. In other words, we allow the engine to run better through a wider RPM range, which is what makes a street engine more fun to drive.

I've also heard that manifold vac helps your motor run cooler?

Some say that connecting the distributor advance to the manifold allows the motor to run cooler, on the basis that ported vacuum retards the timing at idle and causes the engine to run leaner and hotter. Let's ask Norm Schenck again: "An engine that has a better idle, or runs cooler at idle, with manifold vacuum to the vacuum advance, is one that needs more initial ignition advance. Of course, the distributor's advance mechanism would need to be recalibrated so that the increased initial timing would not also increase the total ignition advance at full throttle. Once the engine has an adequate amount of initial advance, it can run ported vacuum, and have better off-idle performance, idle quality, and the ability to sit at idle longer without overheating."

What about a tube out of the back of the base casting - just replace one of those two plugs?

Another fix we have seen is to make a little port plug to replace one of the plugs in the back side of the 97 base. The rear plugs, however, are too far above the butterfly to ever see correct ported vacuum when you need it, no matter what the butterfly position is. It will see a small amount of venturi vacuum at full throttle/high airflows simply from the air rushing by the end of the tube, but this is barely enough to work the distributor's vacuum advance. Remember, we need vacuum advance only at light load /part throttle conditions (cruising), and none at idle and full throttle. Because of the way the 97 throttle plates open (counter-clockwise), a vacuum port on the front of the base is the best solution, at the same height and as near as possible to the transition port. That's what we have in the new Stromberg 97 VP option.

Finally, as with all our Tech articles, we welcome customer feedback and other input. Email us with your thoughts and if it adds to the debate, we can add it in. Thanks! .....tech@stromberg97.com



