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### How to Set Your Timing for Peak Performance

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**“90% of all “carb problems” are ignition timing problems.”**  
*(Lars Grimsrud)*

This tech paper will discuss setting the timing on a Chevy V8. This procedure also applies to other GM V8s.

The procedure outlined here differs from the Service Manual, and is based on my years of experience doing this work in the quickest, least painful, most economical way while keeping the level of quality high. It is recognized that other people will have different methods of doing things, and may disagree with specific methods and procedures that I use.

#### How to Set the Timing

When you think about it, setting the timing at idle speed makes no sense at all: You don't operate your car at idle, and timing changes as the rpm changes. Fact is, the timing spec at idle speed is provided as a simple way for most people to set the timing, and is not a good procedure for optimum performance.

Small block Chevys (and most other GM performance V8 engines) perform best when the total timing (full centrifugal advance plus the initial timing setting with vacuum advance hose disconnected) is all in by 2,500 – 2,800 rpm and is set to about 36 degrees. If you have an adjustable timing light, this is very easy to check. If you don't, you need to scribe a 36-degree mark on your harmonic balancer. Here's how:

Measure the circumference of your harmonic balancer using a sewing tape measure (or other flexible tape measure). Get it as accurate as you can. Take this measurement and divide by 10. The number you get is the distance to 36 degrees. Measure this distance **CLOCKWISE** from your existing harmonic balancer timing mark as viewed from the front of the engine and place a clear mark on the balancer.

Remove your distributor cap and rotor. If you have a points-style distributor with the stock, factory, heavy springs in place, remove one of the springs. Disconnect the vacuum advance. Install the rotor and cap. Loosen the distributor hold-down clamp bolt just enough so that the distributor can be turned, yet leave it snug enough that the distributor will hold its position.

Start the engine. If you're using an adjustable timing light, set the light to 36 degrees advanced. Now rev the engine while observing the timing marks with the light. You will notice that the stock line on the balancer will move up towards the timing plate as rpm increases. Continue to increase rpm until the line does not move any further (centrifugal advance is "pegged out"). Once the timing is "pegged out," the line on the balancer should line up with the "0" mark on the timing tab. Rotate the distributor to achieve this.

If you're using a non-adjustable light, perform the same process, but align your new 36-degree mark with "0" mark on the timing tab.

Shut it down.

Pop the cap and rotor and re-install the spring, if you removed it. Put everything back together, but leave the vacuum disconnected. Start it up. For future reference, make a note of the timing setting at idle. This is your new curb idle timing spec. Now give the engine a few quick rev's past 3,000 rpm and verify that the full timing (36 degrees) is coming in. If it's not, you need to change to a softer set of springs until you get full 36-degree advance before 3000 rpm. (**NOTE:** A stock set of springs will often not allow full centrifugal advance to come in before redline rpm. If you have heavy stock springs installed, don't rev the engine beyond its limits to try to force full advance in.) I suggest obtaining Mr. Gasket kit part number 927 or 928: Use the gold springs on HEI systems. For points-style systems, use one black spring and one silver spring – these springs will get your total timing all in by 2500-2800 rpm, providing very good throttle response and power. The black & silver spring combo can also be used on MSD distributors if you widen out the spring hook ends.

Hook up the vacuum. Re-set your idle speed and idle mixtures if necessary to lower the idle speed. Now do a road test.

The 36-degree 2500 rpm advance curve is optimum for performance, but may require premium fuel. Lug the car around, and punch the throttle at low rpm while listening for detonation ("engine knock"). If you're getting any audible knock, you **MUST** retard the timing. Retard the timing in 2-degree increments until engine knock stops. Engine knock will seriously damage engine components if not corrected. If you get no knock, you may see slightly improved performance at 38 degrees total timing. This is particularly true if you're running at high altitude.

If you have no engine knock under acceleration, but the car "chugs" or "jerks" at cruising speed (light throttle application), you are getting too much vacuum advance on top of the mechanical advance. You may need to change out the vacuum advance diaphragm with a unit producing no more than 16 degrees of vacuum advance. See my paper on "Vacuum Advance Control Units Facts and Specs" for more info on this.

Your timing is now set for best possible performance. Make note of the new setting, and use this for your future tune-up work.

#### **Lars' Suggested Timing Specs for GM V8 Performance Applications:**

- 36 degrees total timing (vacuum advance hose disconnected), all "in" by 2500 rpm
- 18 degrees initial timing at idle (vacuum advance hose disconnected). Note that it may not be possible to achieve the 18-degree initial spec with the 36-degree total without modifying the distributor advance stop system. It is more important to achieve the 36 total than to hit an exact 18 initial. However, if your initial timing is very low (below 12 degrees) with the 36 total, it is important that you repair or modify your distributor in order to achieve correct engine performance
- 16 degree vacuum advance control unit with a pull-in spec that allows the full range of vacuum advance to be pulled in at the engine's idle manifold vacuum level. Connect to manifold vacuum for most applications (this will allow the engine to idle with actual timing at idle of 34 degrees).

#### **Questions, Comments & Technical Assistance**

If you have questions or comments regarding this article, or if you notice any errors that need to be corrected (which is quite possible since I'm writing this from memory...), please feel free to drop me an e-mail. Also, if you need any technical assistance or advice regarding this process, or other maintenance issues, feel free to contact me:

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