

IGNITION TIMING AND HOW IT RELATES TO PERFORMANCE

The number one goal at Pony Carburetors is to allow our clients to enjoy proper performance of their vehicle.

In most cases, once our carburetor has been installed their car will have never run as well before (even when it first rolled off the assembly line). Unfortunately, the carburetor is only one component underneath the hood and for a vehicle to run well, all of the pieces in the engine compartment must function correctly. As meticulous as people try to be, one of the most overlooked items is the distributor and ignition timing. Actually the problem is that people try to use a timing light which ABSOLUTELY DOES NOT WORK! The reason for the failure of timing lights is not the device itself, but the fact that harmonic balancers move. It is the biggest problem in the classic car industry and most people are not even aware of it. In the many years I have walked down the aisles at national car shows, whether the cars are in the daily driver class or the concours trailored class, I have learned to tell if the ignition timing on the vehicle is properly set. On an average trip down the aisle, approximately 40% of the cars have either grossly late timing or distributors that have been installed in the wrong tooth. It is an enormous problem and I often wonder how some of these cars are drivable at all.

I am going to speak now a little bit about the theory of ignition timing in language that most of us will understand. Just like most things with regards to your car, ignition timing is based on the LAWS OF PHYSICS. One of the ways that brand new cars get more horsepower, better fuel economy and better drivability than some of the vintage cars that we are speaking of is the fact they run their ignition timing on verge of detonation at all times. Whether the engine is at idle, going down the road at 50 mph or wide open in a drag race, in order to get the best performance the engine must be running as efficiently as possible. In today's cars, timing is controlled by a computer that adjusts the ignition timing so that the car can run the most efficiently. By having the ignition timing give the spark at precisely the most efficient time, the engine is able

to make the most power, have the best drivability and be the most fuel efficient. In carbureted vehicles, we have to rely on manual adjustment of the initial ignition timing in order to make the engine run most efficiently. This means that we must set the timing to the point where the engine is the "most happy." In most cases, you just rotate the distributor to where the engine idles the fastest and pulls the most vacuum (See the Guide for Engine Vacuum) without pinging (early detonation) on hard acceleration. This can easily be done by ear and/or with a vacuum gauge. If it does ping on hard acceleration, you must back the timing off slightly. If you have to back the timing off more than about 1/8-inch you have a distributor curve issue.

A GUIDE FOR ENGINE VACUUM (IN INCHES AT SEA LEVEL)

- IDLE SPEED 700- 800 RPM unless *
- 1961-73- Six Cylinders = 20 1/4"
 - 260, 289 (Except HI PO), 302 (Except BOSS), 351W V-8 = 20 1/4"
 - 351C, 390, 400, 429 = 18.5"
 - 427 (One carb), 428, 460, 289 HIPO* = 18—18.5"
 - BOSS 302*, BOSS 351* = 18—18.5"
 - Dual Quad* = 16-17"
- * RPM is 1000 to 1100

NOTE: If a higher performance camshaft has been installed (i.e. not factory) the vacuum readings at the idle will be lower. How much lower depends on how radical the cam is.

NOTE: On many pre 1967 engines, getting a port for intake manifold vacuum will be difficult or impossible. On any engine—the distributor vacuum port is NOT a source for manifold vacuum. On ALL engines—there is NO vacuum to the distributor until the engine reaches 1200—1500 RPM's.

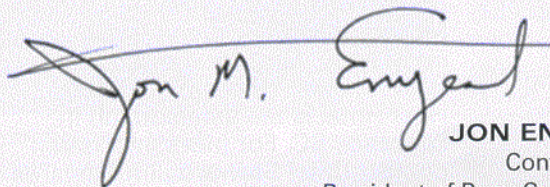
Factory specifications can be misleading. Starting in 1973 there were some very retarded ignition specifications put out by manufacturers. The reason for this was to reduce harmful emissions. By grossly retarding the initial timing

the nitrous oxides were reduced due to lower combustion temperatures. Since the early 70's there have been many advances in the areas of emissions, so this is no longer a recommended practice for carbureted vehicles.

Many people who try to use pump gas in some of the very high performance vehicles (Boss 302, Boss 351 and others) vehicles end up retarding the timing so that the engine does not ping (detonate). These cars often had 10.5 – 11:1 compression ratios right from the factory. In no event will the pump gas of today support more than a 10:1 compression ratio. By retarding the timing, they introduce hesitations, flat spots, less horsepower and poor drivability and fuel economy. Lead additives and octane boosters are uniformly a waste of money. The right thing to do regarding these particular engines is to mix premium pump gas with either racing fuel or 100 low lead AV gas. The other way to help this in addition to mixing the fuel is to have your distributors timing curve re-done.

For almost the last 20 years I have been doing technical seminars at various car shows across the country. I spend a great deal of time in these seminars talking about this very subject and then I make "house calls" to vehicles in the parking lot. I get people's vehicles tuned up right on the spot and people are continually amazed at the difference in the way their cars run. I get follow up letters and phone calls from people I have helped that profess that the methodology that I use is truly the only method that works to set timing. Detailed video and written instructions on setting ignition timing are provided with every carburetor we restore. Please see our website (www.ponycarburetors.com) for more information on many technical issues relating to carburetion. As always we invite any comment or questions you may have about any of our Good Carbs articles.

Happy Driving



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