EDELBROCK JET MAP INFORMATION
For use in nitrous kits #70011 & #70012

Jet Map Information

Edelbrock engineering has conducted dyno testing with the Performer system to provide you with a baseline jet map. Your jet map may change with the use of other components. These jet combinations are supplied with this system to enable you to vary your engine's power output.

Square Flange Jet Map

Approximate HP Gain	Nitrous Jet	Fuel Jet	Timing Adjustment
50	38	38	1°-3° Retard
75	46	46	2°-4° Retard
100	57	57	3°-5° Retard

Spread-Bore Jet Map

Approximate HP Gain	Nitrous Jet	Fuel Jet	Timing Adjustment
50	40	40	1°-3° Retard
75	50	50	2°-4° Retard
100	59	59	3°-5° Retard

Jet Map Footnotes:

Spark Plugs: All jetting combinations shown should use a spark plug one heat range colder than normal.

Fuel: All jetting combinations shown should only be used with 92 octane or higher pump gas.

Edelbrock recommends an NGK spark plug with a heat range of -9 to -11 depending on the nitrous power level being tuned. When in doubt, always go to the next cooler heat range plug.

The dyno tests were conducted at Edelbrock using a highly modified Big Block Chevrolet. Modifications included Edelbrock intake manifold, cylinder heads, dyno headers, pistons, rods, crankshaft, and improved ignition. These tests were conducted with 950 psi nitrous and 6.5 psi fuel pressure. All stated timing adjustments listed in the jet map is where the motor being tested performed best. Final timing should be adjusted to achieve best power and/or MPH per application.

Any variation in jetting patterns other than what is listed above and engine damage could occur. Please contact the Edelbrock Technical Department with any questions you have concerning jetting patterns and their effects on engine performance.

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Engine Operation Considerations

When used correctly, nitrous oxide safely elevates cylinder pressures and temperatures while increasing combustion rate. These characteristics make the engine more sensitive to detonation. To ensure proper performance and engine life, the following tips are suggested:

Adequate Fuel Pressure and Delivery:
When designing your fuel system, plan on your pumps and lines flowing at least 0.1 gallons per hour per horsepower at rated pressure. The testing at Edelbrock was conducted with a fuel pressure of 6.5 psi. Any variation from this fuel pressure will cause your final air/fuel ratio to change. Consult our technical department for any questions on fuel pressure and its effects on final air/fuel ratios when using nitrous oxide. Edelbrock recommends setting your fuel pressure flowing. We offer a flow tool (Edelbrock Part #76506) to help in this process.

Fuel Quality:
Because nitrous oxide is an oxidizer, fuel selection is critical. Both octane and fuel consistency affect fuel burn rate. The oxidizer quality of nitrous oxide will accelerate the burn rate, so we recommend a high quality type of gasoline. We also recommend you use the same grade of gasoline every time you use your nitrous oxide system. This will maintain the same fuel burn rate every time. Please refer to the jet map footnotes for information on what fuel types and fuel qualities that were used during the testing here at Edelbrock.

Engine System Upgrades:
With all performance modifications complementary system upgrades will always serve to elevate the consistency and longevity of an engine, especially when using nitrous oxide as a power adder. Ignition upgrades, intake manifold upgrades, and fuel controls and fuel pumps can all add to the performance of a nitrous oxide injected engine.

Cast Pistons/Hypereutectic Pistons:
With all nitrous oxide applications, forged pistons are highly recommended. Because of heightened potential for detonation, cast pistons and hypereutectic pistons are more prone to failure and cannot handle horsepower increases over 125 hp. Never initiate your nitrous system before you are at full-load, wide-open throttle conditions. Cast pistons will not be able to survive this kind of stress.

Baseline Tuning Suggestions

Utilizing nitrous oxide as a power adder is similar to a supercharger or a turbocharger in that it increases the amount of air an engine can get over a naturally aspirated condition. There are some significant differences:

1. Nitrous oxide is very oxygen rich. This oxygen is of a much higher density, so the opportunity to extract very high quotients of power is high.
2. Nitrous oxide injection does not have a parasitic load factor associated with its use and as such does not cost horsepower in the manner of a crank-driven supercharger or an exhaust-driven turbocharger.

The most important thing to remember when looking at baseline tuning issues associated with nitrous oxide is that a lean condition is bad. Two parameters that will keep you from catastrophically affecting your engine are:

Nitrous Bottle Pressure...Always keep your bottle pressure between 900 and 950 psi. Yes, there are racers that use different pressures, but the testing we did here at Edelbrock to ensure the jetting maps within this manual are correct, was done in this pressure range. Use any higher pressure than 950 psi and you will be lean. Use any pressures below 900 psi and you will be rich.

Fuel Pressure...Always ensure you have between 6-6.5 psi of fuel pressure every time you enable your nitrous system. We used 6 to 6.5 psi of fuel pressure to perform our jet map testing on this system. If you do not have at least 6psi of fuel pressure going to the fuel solenoid, when it is activated, you will be encountering a lean condition. If you were to have more than 6.5 psi of fuel pressure, when it is activated, to the fuel solenoid, you would have a rich condition.

There are many different ways to jet to a specific power level. However, for the continued safe operation of your nitrous system, we suggest you do not move too far away from the jet map listed within this manual. Catastrophic engine failure could result.

Your 2-Stage Performer RPM nitrous system comes with matched sets of nitrous and fuel jets. These are validated jetting combinations, based upon 900 to 950 psi nitrous oxide bottle pressure, and 6 to 6.5 psi flowing fuel pressure. Operating with these pressure levels should yield safe and reliable power increases.

Spark Plug Facts

The most important aspects to be considered when selecting a Spark Plug for your nitrous combination are, but not limited to: heat range, firing end design, material construction type, reach, thread size, and gap. We advise lowering the heat range of your spark plugs 1 to 2 steps for every 100 hp added with nitrous. We do not recommend the use of Precious metal type plugs i.e.: Platinum, Iridium, Gold Palladium, or Yttrium. The tips on these types of plugs can get very hot and cause detonation. It is best to use a non projected tip plug without a fine wire center electrode designed for a gap between .025" and .035" with a shorter preferably thicker ground strap. Never try to gap a plug designed for a .060" gap down to.035".

Edelbrock suggest an NGK spark plug with a heat range of -9 to -11 depending on the nitrous power level being tuned. When in doubt, always go to the next cooler heat range plug.

How to Read Spark Plugs From a Nitrous Oxide Injected Engine...

Spark plugs are a window into the combustion chamber. They will tell you many things about the operation of the vehicle. Here are some tips on looking at spark plugs to “read” what is happening with your engine:

Correct timing, mixture and spark plug heat range

Ground strap retains “like new” appearance. Edges are crisp, with no signs of discoloration. Porcelain retains clear white appearance with no “peppering” or spotting.

Excessively rich mixture

Porcelain may be fuel-stained, appearing brown or black. In extreme cases, ground strap, electrode and porcelain may be damp with gasoline, or smell of fuel.

Detonation

Edges of ground strap may become rounded. Porcelain has the appearance of being sprinkled with pepper, or may have aluminum speckles. During heavy detonation, the ground strap tip may burn off. This phenomena can result from excessive ignition timing, too high a heat range spark plug, or inadequate fuel octane.

Excessively lean mixture

Edges of ground strap may become rounded, or broken. (Under moderate overheating, the tip of the ground strap can discolor, usually turning purple, or the entire ground strap can become discolored.)

5.0 Ignition Timing and Nitrous

Because we are oxidizing the air/fuel mix going into the engine when nitrous oxide is used, we must pay close attention to the ignition timing profile. Remember, "nitrous" oxygen is more dense than "atmospheric" oxygen and resulting in an accelerated burn rate of your fuel.

In anticipation of the quicker burn time, you must retard the timing of the ignition system when using nitrous oxide. The more power we try to make, the more timing in degrees we must remove from the timing profile. This is not in total advance but the time in which we bring timing in (the advance curve).

This is why all nitrous users are so concerned with evidence of detonation. The accelerated burn rate of the air/fuel charge can cause severe detonation without a "nitrous" ignition strategy. A timing profile that is accelerated and a total timing number retarded will keep you from experiencing catastrophic engine damage.

The general rule of nitrous use ignition timing should be to retard the "total" advance number approximately 2 degrees for every 50 HP increase when using nitrous oxide. It is always best to start with your engines best total timing (without nitrous) and reduce total timing from there. Use an initial timing retard setting that is at least 2-4 degrees more retarded than you expect to be the best setting for your application. All stated timing adjustments listed in jet maps is where the motor being tested worked best.

Every aspect of the vehicle and engine affects your nitrous systems performance-- vehicle weight, converter, gearing, engine displacement, cylinder head type, camshaft, compression, manifold and induction type ect.. The exact amount of timing to pull out varies for every combination. Start conservatively, and put timing back in gradually. On a Nitrous system, even 1 degree change in advance can make a big difference.

When using aftermarket ignition components and/or systems, it would be advisable to contact the manufacturer for information on using their components with a nitrous system. It is always better to be very conservative in your timing approach and tune towards an optimum timing setting.

Example:

Ignition timing without Nitrous Oxide	38 degrees "total"
100 HP increase from Nitrous Oxide	2 degrees "retard"
Initial safety margin	2 degrees "retard"
Total timing with Nitrous Oxide	34 degrees "total"

The following test plan, for determining ignition timing, will give you a guide to determine the best timing profile for your vehicle, hopefully avoiding engine damage during the tuning phase:

1. Install the nitrous jetting for a selected horsepower increase. Use the 100 horsepower setting to learn the finer points of working with nitrous oxide. This will keep your margin for error as large as possible.
2. Estimate the reduced ignition timing that you think will produce best power, based upon the 2° retard per 50 HP increase rule.
3. Set ignition timing 2°-3° retarded from your best power estimate setting. This is your cushion for error.
4. Stabilize nitrous bottle pressure at 900 to 950 psi. It is best to select a pressure and keep the pressure to ±¼ psi.
5. Run your vehicle in a controlled manner (like a ¼ mile drag strip) without the use of nitrous. This is called "on motor". Note vehicle mph as a baseline to measure nitrous assisted increases.
6. Adjust your ignition timing to a nitrous timing setting.
7. Run your vehicle in the same controlled manner (like a ¼ mile drag strip) with the use of nitrous. Note vehicle mph increase and compare it to your baseline.

Note: Listen for any knocking sounds when running the vehicle. Watch your temperature gauges. Continued nitrous use will elevate coolant temperatures. See Testing Checklist for more testing methodology helpful hints.

8. What Happened? Did your vehicle go faster? slower? What did the engine sound like? Did the nitrous system work? Refer to the timing charts, and examine spark plugs for signs of detonation.

   a. If power increased or vehicle mph increased and your spark plugs show no signs of overheating or detonation, you could try to increase ignition timing 1° to 2°.

   b. If power increased or vehicle mph increased and spark plugs begin to show slight signs of detonation - STOP! Do not advance timing further. You may choose to reduce timing 2° at this point for an extra margin of safety. At this point, you need to look at the "Troubleshooting" section for assistance. Pay close attention to the fuel supply with your nitrous system.

   c. If power decreases or vehicle mph decreases, check for burned spark plug or engine damage, and reduce ignition timing 2°. Please refer to the "Troubleshooting" section of this manual for help in determining any system trouble you may feel that you are having.

9. Repeat step 6 until optimum ignition timing is obtained.

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