PERFORMER RPM NITROUS PLATE KITS
Catalog #70060, #70061, #70063

JET MAP INFORMATION

Edelbrock engineering has conducted dyno testing with the Performer RPM system to provide jetting maps for the three separate plates at different jetting levels. These jet combinations are supplied with this system kit to enable you to vary your engine's power output. On a typical mildly modified 350 cubic-inch engine, you can expect the following approximate power gains for each of the jetting levels:

Square-Flange Jet Map

HP Gain	Nitrous Jet	Fuel Jet	Timing Adjustment	Footnotes
100	57	57	3°-5° Retard	1, 3
150	68	68	5°-7° Retard	1, 3
175	78	78	6°-8° Retard	1, 3
200	85	85	7°-9° Retard	2, 4, 5, 6
250	99	99	9°-11° Retard	2, 4, 5, 6

Spread-Bore Jet Map

HP Gain	Nitrous Jet	Fuel Jet	Timing Adjustment	Footnotes
100	59	59	3°-5° Retard	1, 3
150	71	71	5°-7° Retard	1, 3
175	81	81	6°-8° Retard	1, 3

Dominator-Flange Jet Map

HP Gain	Nitrous Jet	Fuel Jet	Timing Adjustment	Footnotes
100	57	57	3°-5° Retard	1, 3
150	71	71	5°-7° Retard	1, 3
200	85	85	7°-9° Retard	2, 4, 5, 6
250	104	104	9°-11° Retard	2, 4, 5, 6

Jet Map Footnotes:

The jet map above has footnotes that offer the following instructions and technical information:

1. Use 1 heatrange colder plugs
2. Use 2 heatrange colder plugs.
3. Use 92 octane pump gasoline or better.
4. Use 110 octane race gasoline or better.
5. Use a Single Plane manifold only. DO NOT use a dual plane manifold at this horsepower level.
6. Advanced tuning required. Suggested timing adjustment is just a guideline. Engine component modifications may affect timing.

The dyno tests were conducted at Edelbrock using a mildly modified 350 cubic-inch engine. Both dual-plane and open-plenum intake manifolds were tested to ensure validity of jetting maps for each horsepower setting. Modifications included Edelbrock intake manifolds, Edelbrock aluminum heads, dyno headers, and improved ignition. We also used different grades of fuel and colder plugs during the testing. All stated timing adjustments listed in jet maps is where the motor being tested worked best. Final timing should be adjusted to achieve best power and/or MPH per application. These tests were conducted at 950 psi nitrous and 6 psi to 6.5 psi fuel.

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.

NOTE: *The last two horsepower settings (200 and 250) are for single plane manifolds only. In testing, we found that dual-plane manifolds have some distribution problems at these super high flowrates that could cause engine damage. Please contact the Edelbrock Technical Department with any questions you have concerning jetting patterns and their effects on engine performance when using a dual-plane manifold.*

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 from atmospheric conditions. There are some significant differences:

1. The "air" in 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 very high.
2. Nitrous oxide injection does not have a parasitic load factor associated with its use like a turbocharger or a supercharger. Meaning, it does not cost as much horsepower as 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 Nitrous "rich" 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 your engfine will be lean. Use any pressures below 900 psi and your engine will be rich.

Fuel Pressure: Always ensure you have between 6 and 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 6 psi of fuel pressure going to the fuel solenoid, when it is activated, your engine will be lean. If you were to have more than 6.5 psi of fuel pressure to the fuel solenoid when it is activated, your engine would be rich.

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 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 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.

How To Read Spark Plugs From A Nitrous Oxide Injected Engine:

Spark plugs are a window into the combustion chamber. They will tell 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. Under moderate overheating, the tip of the ground strap can discolor, usually turning purple, or the entire ground strap can become discolored.

Ignition Timing and Nitrous Oxide

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 results 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 only 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 2-3 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	4 degrees “retard”
Initial safety margin	2 degrees “retard”
Initial timing with Nitrous Oxide	32 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.

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 0.10 gallons per hour per horsepower. The testing at Edelbrock was conducted with a fuel pressure of 6.5 psi. Any variations 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.

Performer RPM Fuel System Requirements

When using the Performer RPM Series Kits, the potential horsepower gains are extremely high. The critical area for continued success with your nitrous system lies in the fuel system. In the case of the Performer RPM Series Nitrous Systems, an auxiliary fuel supply system is a required addition to your nitrous system. A high flow electric fuel pump and high capacity adjustable fuel pressure regulator are both recommended to ensure the fuel flow rate is enough to ensure proper system operation. The minimum size we recommend for the fuel inlet feed line is a -6 (3/8" inch), with a size of -8 (1/2" inch) recommended for the higher horsepower settings.

Performer RPM System Monitoring Requirements

Fuel pressure and nitrous pressure gauges are very important. Your fuel pressure must be set properly and a gauge is the only sure way to monitor system performance. The same is true of the nitrous bottle pressure. A nitrous pressure gauge is the only way to ensure that your system calibrations are within the parameters required of your horsepower settings.

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 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.

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, fuel controls and fuel pumps can all add to the performance of a nitrous oxide injected engine.

Forged Pistons

With all nitrous oxide applications, forged pistons are highly recommended. Because of heightened potential for detonation, cast 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.

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