

2-STAGE PERFORMER RPM NITROUS SYSTEM

Catalog #70003 & #70004

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2-Stage Performer RPM Nitrous System

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Thank You....

...for purchasing an Edelbrock Nitrous Oxide Injection System.

Nitrous Oxide injection is one of the most exciting performance enhancements, for the dollar invested, on the market today. With the use of nitrous oxide come some important safety considerations. This manual has been written to help you during the installation and use of your Edelbrock Nitrous System. Please read it completely before you install and use your system. Please pay close attention to the safety information at the beginning of each section. The information contained there specifically pertains to each of the components and installation methodologies within the section.

Please take the time to read and understand the following....

By installing your Edelbrock Nitrous System, you indicate you have read this document and you agree with the terms stated below:

It is the responsibility of the purchaser to follow all installation instruction guidelines and safety procedures supplied with the Edelbrock Nitrous Systems. It is also the responsibility of the purchaser to determine the compatibility of the product with the vehicle or the device on which the purchaser intends to install it.

Edelbrock Corporation assumes no responsibility for damages occurring from misuse, abuse, improper installation, improper operation, lack of responsible care, or all previously-stated reasons resulting from incompatibility with other manufacturer's products and/or systems.

Edelbrock Corporation neither recommends nor condones the use of products manufactured or sold by Edelbrock Corporation for use on vehicles, which may be driven on public roads or highways, and assumes no responsibility for damages incurred by such use.

Edelbrock Corporation assumes no responsibility for damages incurred by the use of products manufactured or sold by Edelbrock Corporation on vehicles used for competition or racing.

Edelbrock General Warranty

It is the constant endeavor of Edelbrock Corporation to give our customers the highest quality products obtainable. Edelbrock warrants each new product, except Performer Series Carburetors, Race Division Parts, Tubular Exhaust Systems, RPM Series Mufflers, Cat-Back Systems and Performer IAS Shock Absorbers which are warranted separately, to be free from defects in both workmanship and material for a period of one (1) year from the date of purchase, provided that the product is properly installed, subjected to normal use and service and that the product is not modified or changed in any way, negligence by customer or installer or used for racing or competition purposes.

Our warranty service and repair facility is located at 2700 California Street, Torrance, California 90503. Customers who believe they have a defective product should either return it to the dealer from which it was purchased or ship it directly to Edelbrock along with proof of purchase and a complete description of the problem. The product must be returned freight pre-paid. If a thorough inspection of the product by the factory indicates defects in workmanship or material, our sole obligation shall be to repair or replace the product. Warranty covers only the product itself and not the cost of installation or removal.

Edelbrock Corporation shall not be liable for any and all consequential damages occasioned by the breach of any written or implied warranty pertaining to this sale in excess of the purchase price of the product sold.

If you have any questions regarding a product or installation, please contact our Technical Department, toll free at 1-800-416-8628 from 7:00am to 5:00pm PST, Monday through Friday.

Thank you again for choosing Edelbrock Nitrous Systems.

Caution!!

Before You Install Your Edelbrock Nitrous System...

Please read this Installation manual fully before installing this system.

You will need to have available the following tools:

Hand Tools:

- Socket set including ratchets and extensions
- Screwdrivers
- Pliers
- Bench vise
- Wire crimping pliers, wire strippers
- Floor jack
- Measuring tape and placement markers
- Vehicle jackstands
- Safety glasses
- Timing light

Power Tools:

- Power drill
- Drill bits

You should understand the following skills:

- Power tool safety procedures
- Undercar safety procedures
- Proper measuring techniques
- Proper electrical assembly techniques
- Basic engine operation and tuning techniques which include:
 - Fuel pressure measurement techniques
 - Timing adjustment techniques



Anytime you have questions or concerns with your Edelbrock Nitrous System, please call our
Technical Support Hotline at 1-800-416-8628
before you start your engine.

WHAT IS NITROUS OXIDE?

Nitrous Oxide is a cryogenic gas composed of nitrogen and oxygen molecules. It is stored as a “gas over a liquid” which means that both liquid and gaseous nitrous oxide is delivered into your engine. It is 36% oxygen by weight, which is what produces the added horsepower. By injecting more oxygen (and a corresponding fuel signal), we create the additional power much like a supercharger or a turbocharger does.

Nitrous Oxide is considered an “oxidizer” and not a fuel. Nitrous oxide is non-flammable by itself. Because nitrous oxide is a cryogenic, the same safety methods in handling dry ice apply to nitrous. Direct contact with the skin will cause a burn similar to contact with dry ice. The exception in using nitrous oxide comes from increased breathing hazards associated with the gaseous properties of nitrous oxide.

Nitrous Oxide is offered for sale in two common grades, which are U.S.P., and *Nytrous Plus*. U.S.P. nitrous oxide is medical grade nitrous oxide. Its common use is dental and veterinary anesthesia as well as use as a propellant in food such as canned whip cream. U.S.P. is not available to the public and would provide no advantage in the making of horsepower over the automotive grade nitrous oxide.

Nytrous Plus was specifically designed for automotive consumption and differs from U.S.P. in that it contains trace amounts of sulfur dioxide (100 parts per million or “PPM”) added to prevent substance abuse. The Sulfur Dioxide is an irritant to all of your breathing passageways and will cause sore throats and sore nasal passages. *Nytrous Plus* was specifically created for automotive applications and is available for sale to the public at many speed shops across the USA.

Safety Steps For Working With Nitrous Oxide

1. Never inhale *Nytrous Plus* (Nitrous oxide (N₂O) for vehicular use) as continued exposure can cause **death**. *Nytrous Plus* has a maximum of 100 parts per million (ppm) of sulfur dioxide and will cause irritation to nose and throat passageways.
2. When working around any high-pressure gas including nitrous oxide, take all precautions to ensure that exposure to nitrous oxide is minimized.
3. **Do not** vent nitrous oxide to atmosphere in confined spaces. Only vent nitrous oxide in well-ventilated and open areas.
4. Liquid nitrous oxide **can cause burns to human flesh** so protect all skin in and around your hands, arms and face. Wear safety glasses and rubber gloves to protect from liquid nitrous oxide splatter.
5. When venting down the nitrous system, vent the line down closest to the nitrous bottle.
6. **Do not** use any form of Teflon tape as sealant on fitting connections. **Use only Teflon paste.**
7. When washing components, ensure the clean components are completely dry, free of oils, and solvents. Failure to remove all liquids could cause component or system failure.
8. Always turn the bottle off before making any repairs to the nitrous delivery system.
9. To safely release nitrous oxide in a pressurized line;
 - a. Position vehicle in a well-ventilated, unconfined space.
 - b. Turn bottle off.
 - c. Slowly loosen the nitrous feed line at the bottle until you hear a light hissing noise.
 - d. Allow the entire nitrous pressure to vent from the line.
 - e. Perform your work on the system.
 - f. Tighten the nitrous line to the bottle.
 - g. Slowly open the nitrous bottle valve, listening for leaks.
 - h. Perform leak checks on all affected fittings and the bottle fitting.

1.0 Introduction to your Edelbrock 2-Stage Performer RPM Nitrous System

Within the pages of this manual is information, safety tips and operation instructions for your new Edelbrock Nitrous System. Watch for these symbols to know where to go for information.

There is safety related information here.

shows where technical information about your vehicle or specific skills that may help during installation.

call Edelbrock Technical support hotline for more information.

1.1 General Information

The Edelbrock 2-Stage Performer RPM Nitrous System (Part Number 70003 and 70004) is intended for use on domestic style V-8 engines using single square-flange 4 bbl. carburetors (Part Number 70003), and Spread-bore 4 bbl. carburetors (Part Number 70004). Horsepower and torque increases can vary with equipment upgrades and modifications.

These types of systems utilize an adjustable plate that seats in between the carburetor and the carburetor mounting flange on the intake manifold. The adjustability comes from the ability of the plate to accept different orifice-sized jets. The plate has y-shaped jet fittings at opposite ends of the plate that control the amount of nitrous oxide and fuel flow into the engine.

This system has been designed with some flexibility as to where certain components can be located to allow easy installation on vehicles with upgraded or modified equipment. The solenoid and microswitch brackets are designed to be manipulated (bent, cut, twisted, etc.) and the electrical components have properly sized and ample lengths of wire.

Contact your local automotive store, motorcycle shop or race track for refilling of your bottle. Trust a professional to properly fill your bottle and reference your installation manual when re-installing your filled bottle back into your vehicle.

Always take care when handling a full bottle of nitrous oxide. Please reference this manual for further safety measures to take during the handling of a nitrous oxide bottle.

Please follow all safety methods during the installation of your Edelbrock Nitrous System, and follow all vehicle regulations and road laws when using your nitrous system.

1.2 Jet Map Information

Edelbrock engineering has conducted dyno testing with the 2-Stage Performer RPM System to provide jetting maps for the two separate plates at different jetting levels. These jet combinations are supplied with this system 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					
1st Stage Jetting		Approx. HP Gain	Fuel PSI	Timing Adj.	Footnotes
Nitrous	Fuel				
38	46	50hp	6.5 PSI	2° Retard	③
46	53	75hp	6.5 PSI	3° Retard	③
57	65	100hp	6.5 PSI	4° Retard	③
2nd Stage Jetting		Approx. HP Gain	Fuel PSI	Timing Adj.	Footnotes
Nitrous	Fuel				
71	75	150hp	6.5 PSI	6° Retard	① ③
85	89	200hp	6.5 PSI	8° Retard	② ④ ⑤
99	102	250hp	6.5 PSI	10° Retard	② ④ ⑤

Spread-Bore Jet Map					
1st Stage Jetting		Approx. HP Gain	Fuel PSI	Timing Adj.	Footnotes
Nitrous	Fuel				
40	45	50hp	6.5 PSI	2° Retard	③
50	55	75hp	6.5 PSI	3° Retard	③
59	62	100hp	6.5 PSI	4° Retard	③
2nd Stage Jetting		Approx. HP Gain	Fuel PSI	Timing Adj.	Footnotes
Nitrous	Fuel				
59	62	100hp	6.5 PSI	4° Retard	③
71	75	150hp	6.5 PSI	6° Retard	① ③
81	86	175hp	6.5 PSI	6° Retard	② ③

① Use 1 heat range colder plug.

② Use 2 heat range colder plug.

③ Fuel use 92 Octane Pump Gasoline or Better.

④ Fuel use 110 Octane Race Gasoline or Better.

⑤ Single Plane Manifold Only. **DO NOT** use a Dual Plane Manifold at the Power Level.

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 jet 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. Final timing should be adjusted to achieve best power and/or MPH per application. See section "Ignition Timing and Nitrous" for more information on timing selection.

These jet patterns are designed to be rich and will provide the above listed power settings under normal operational usage of this system. 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.

1.3 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 to 7 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.

Performer RPM Fuel System Requirements:

When using the Performer RPM series kits, the potential horsepower gains are quite high. The critical area for continued success with your nitrous system lies in the fuel system. In most cases, an auxiliary fuel supply system will be 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 setting.

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. 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.

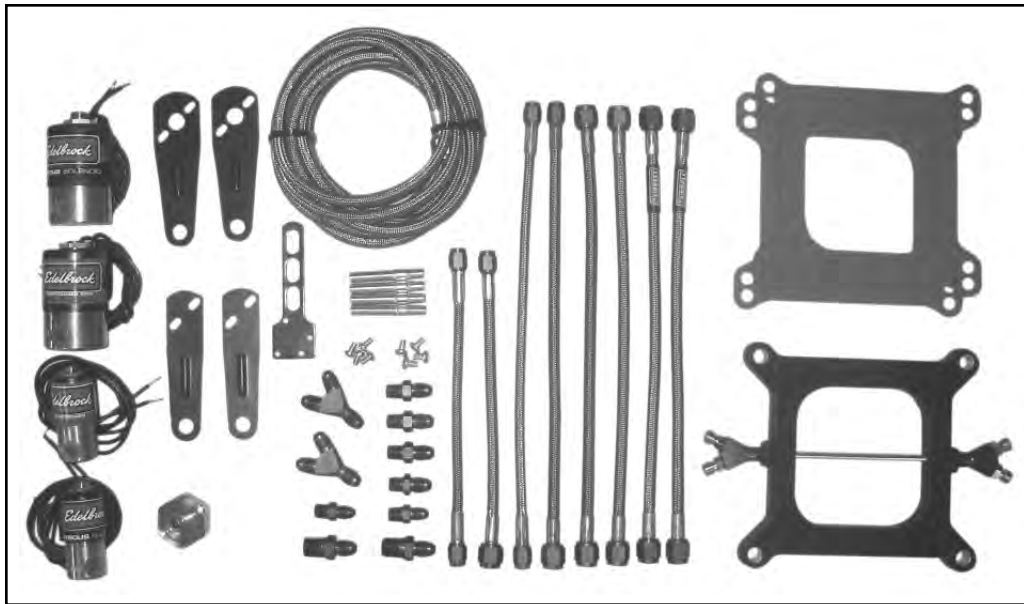
Engine System Upgrades:

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.

1.4 2-Stage Performer RPM Nitrous System Bill of Materials



Qty.	Description	Qty.	Description
	<u>Plate and Hardware</u>		<u>Bottle Hardware</u>
1 ea.	2-Stage Performer RPM Nitrous Plate	1 ea.	660 4AN Bottle Nut
2 ea.	Plate Gaskets	1 ea.	Teflon Washer
4 ea.	Carburetor Studs		
	<u>Solenoids and Solenoid Hardware</u>		<u>Electrical System Components</u>
1 ea.	Performer Nitrous Solenoid	1 ea.	Micro Switch Bracket
1 ea.	Performer Fuel Solenoid	1 ea.	Electrical Component Packages (see "3.0 Electrical System Installation" section)
1 ea.	Performer RPM Nitrous Solenoid		
1 ea.	Performer RPM Fuel Solenoid		
2 ea.	Performer Solenoid Brackets w/ Screws		<u>Hoses</u>
2 ea.	Performer RPM Solenoid Bracket w/ Screws	2 ea.	4AN 12" Steel Braided Hose, Red
		2 ea.	4AN 12" Steel Braided Hose, Blue
		1 ea.	4AN to 3AN 12" Steel Braided Hose, Blue
		1 ea.	3AN 12" Steel Braided Hose, Blue
		1 ea.	4AN to 3AN 8" Steel Braided Hose, Red
		1 ea.	3AN 8" Steel Braided Hose, Red
	<u>Fittings</u>		<u>Not Shown Above</u>
1 ea.	4AN x 1/4"NPT Fitting, Blue		Bottle and Bottle Brackets
2 ea.	4AN x 1/8"NPT Fitting, Blue		Various Included Jets
1 ea.	3AN x 1/8"NPT Fitting, Blue		
1 ea.	4AN x 1/4"NPT Fitting, Red		
2 ea.	4AN x 1/8"NPT Fitting, Red		
1 ea.	3AN x 1/8"NPT Fitting, Red		
1 ea.	4AN Y-Fitting, Blue		
1 ea.	4AN Y-Fitting, Red		

2.0 Nitrous System Installation

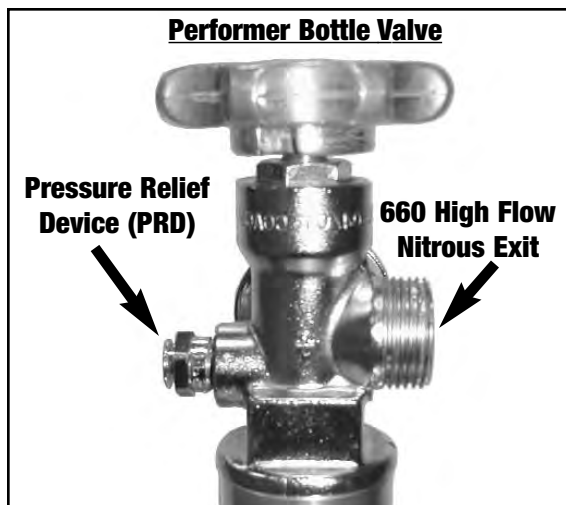
2.1 Nitrous Bottle Installation

The nitrous oxide storage cylinder is typically called a “nitrous bottle”. It is an aluminum cylinder, designed and manufactured to withstand very high pressures. The valve on top of the bottle is a high-flow design that allows easy opening and closing which controls the nitrous flow to the engine compartment.

Accurate calibration of your nitrous system depends on the bottle remaining at a stable temperature. In vehicles (such as Corvettes) where the bottle must be mounted in an area subject to direct sunlight, it is suggested that the bottle be shielded with a bottle blanket.

If the bottle is mounted inside the passenger compartment or in a space that has access to the passenger compartment such as hatchbacks or vehicles that feature fold down rear seats, the pressure relief device (PRD valve) must be vented externally from the cockpit. This procedure will prevent the passenger compartment from filling with a cloud of nitrous oxide, should the safety pressure relief valve rupture. For more information, please contact the tech line.

Special consideration should be made to protect the bottle installation by not placing the bottle in a known crumple or crash zone within the vehicle. At no time should the bottle be mounted within the seating area of the passenger compartment of a street-driven vehicle.



Here is the Performer Bottle Valve. Installed on all bottle valves used in Edelbrock Nitrous Systems, is a Pressure Relief Device or “PRD”. It is a safety valve designed to vent the contents of the bottle into the atmosphere in case of a catastrophic event like a collision. It is also installed to prevent the over-pressurization of the bottle. Unsafe bottle pressure is caused by over filling or elevated bottle temperatures.

There are two types of PRDs - Internal piping and external piping. The internal type requires no additional parts. The external type requires a safety blowdown tube designed to route the gas, if the PRD happens to rupture, to the outside of vehicle. The internal type is design to vent directly off the bottle into the atmosphere.

It is illegal to tamper with or remove this device.

Bottle Safety Information

1. **Do not** attempt to remove the bottle valve. Please return your bottle to Edelbrock if service is required to the siphon tube inside the bottle or the bottle valve itself.
2. **Never** heat the outside of your nitrous bottle with an open flame like that of a torch.
3. **Do not** strike the surface of your nitrous bottle with a heavy or sharp object.
4. **Do not** drop your nitrous bottle.
5. **Do not** attempt to grind off or destroy any imprinted markings on the face of the bottle.
6. **Do not** remove, modify or otherwise tamper with the safety valve on the bottle valve.
7. **Do not** attempt to use a bottle that has been damaged or tampered with.

Racing Vehicles

Before you mount a nitrous bottle in a vehicle intended for use in racing or sanctioned events, check with the sanctioning association or local racetrack for any rules regarding bottle installation. Most associations require the bottle be mounted within the confines of the safety roll cage, with the safety pressure relief cap vented outside the driver’s compartment.

2.2 Bottle Orientation

Accurate calibration of your nitrous system depends on the bottle remaining at a stable temperature. Choosing the proper location and orientation for your bottle can greatly affect the overall operation of the nitrous system. Please read the entire bottle mounting instruction section before making your final bottle location decisions.

Bottle placement is critical to the performance of your nitrous system. It is important to understand how the bottle valve and siphon tube are assembled to properly orient the bottle in your vehicle and ensure that it picks up liquid nitrous while undergoing acceleration. All nitrous bottles are assembled so that the bottom of the siphon tube is at the bottom of the bottle, opposite the bottle label.

An Edelbrock nitrous bottle cannot be mounted upside-down. Edelbrock does not offer a non-siphon tube bottle for automotive use. If the bottle must be mounted parallel to the axles of the vehicle (sideways), the label must be angled at approximately 45 degrees toward the front of the vehicle. This orientation will position the siphon tube toward the rear and pointing to the lower rear-facing quadrant of the bottle. All of this positioning information is critical to system operation. It is most important to draw as much liquid nitrous as possible. The siphon tube cannot do this unless the bottle is positioned correctly.



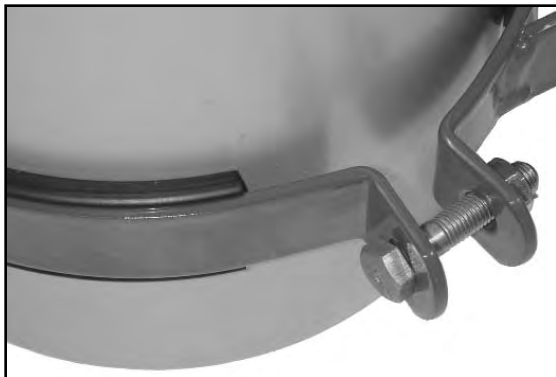
The most efficient mounting is the lay-down position with the valve handle toward the front of the vehicle. This position allows the greatest amount of liquid to be used before the siphon tube begins to pick up gaseous nitrous oxide.

2.3 Nitrous Bottle Installation

After you have determined the location and orientation of the nitrous bottle, use the following procedure to install the bottle:

2.3.1 Street Car Installations

1. Disconnect vehicle's battery.
2. Determine the location of the bottle within the confines of the rear of the vehicle.
3. Once a mounting location has been determined, raise the vehicle (following all safety practices involved in working on a vehicle from under the vehicle) and verify that there are no fuel lines, fuel tank(s), brake lines, emissions equipment, or structural members in the way of potential mounting bolt locations.
Note: *It may be necessary to remove the fuel tank depending on the location where you install the bottle.*
4. Install the rubber insulators within the bottle brackets.
5. Slip bottle into the mounting brackets.
6. Using the mounting bracket bolt holes as templates, mark an area for each of the brackets with chalk, scribe, or marking pen to locate the bolt placements for drilling.
7. Drill two (2) 3/8" mounting holes for each bracket.
8. If heater blanket is used, brackets must be installed 8-1/2 inches apart from each other.
9. Install the bottle mounting brackets using "Grade 8" bolts, nuts and flat washers (not included with kit). Use fender washer underneath the vehicle for sheet metal mounting.
10. Tighten the mounting bolts using a thread locking compound (not included with kit).
11. Mock up Safety Blowdown tube on bottle to find where tube will go through floor (if required).
12. Mark floor where tube appears it will go.
13. Using a 1/2" drill bit, drill through floor on mark.
14. Install Safety tube on bottle and cut off excess tube so that only 1 to 2 inches are protruding below floor.



Shown here is a bottle with a bottle bracket properly installed with the rubber insulator. The distance between the bottle brackets is somewhat adjustable. Remember, mount the short bottle bracket at least 1" from the bottom of the bottle, and never cover any of the bottle label with a bottle bracket.

Do not attempt to install the bottle in the bracket without the rubber insulator. The bottle hoop on the bracket is designed to include the thickness of the insulator.

2.3.2 Race Car Nitrous Bottle Installations

Install the bottle brackets in accordance to race track and/or sanctioning body rules. Contact the factory for assistance with meeting sanctioning body rules.

2.3.3 Nitrous Bottle Installations For Vehicles With Hatchbacks Or Trunk Areas That Are Connected With The Passenger Compartment.

Please contact **EdelbrockTechnical Hotline at (800) 416-8628** for more information.

2.4 Nitrous Feed Line Mounting

1. Determine the route your main nitrous feed line will follow. Ensure the path does not route the nitrous feed line too close to the exhaust system, suspension, electrical lines/components or tires.
2. Attach nitrous supply line to bottle.
3. Feed nitrous line along proposed route.
4. Secure nitrous supply line to underside of vehicle.

Note: Stainless steel covering of the main nitrous feed line is very abrasive. Shield painted components or sensitive system components like electrical, fuel lines, brake lines or suspension components to prevent them from contacting main feed line. Rubber hose can be slid over and retained as a chafe guard.

5. Leave nitrous line loose pending installation of nitrous solenoid.

2.5 Solenoid Assembly

Use the following procedures to install the Performer and Performer RPM nitrous solenoids.

Note: Remember to use Teflon paste only on pipe threads. **Do not use Teflon tape.**

Hint: Placement of the solenoid is often limited by the lack of possible mounting locations in the engine compartment. However, if possible, observe the following suggestions:

Solenoid Safety Information

1. Keep solenoid and lines away from exhaust components.
2. Trial fit the solenoids with all lines attached to ensure a proper fit.
3. Solenoids may be mounted sideways or upside-down, if necessary.

2.5.1 Performer RPM Solenoid Assembly

1. Hold the Performer RPM Nitrous Solenoid securely (such as in a bench vise) being careful not to harm the solenoid or block the inlet or outlet of the solenoid.
2. Install the nitrous filter fitting (Blue filtered fitting 4AN x 1/4NPT) using liquid Teflon paste in the inlet port of the Performer RPM Nitrous Solenoid. Be careful not to over tighten the fitting causing it to strip or gaul.
3. Install the 4AN x 1/8NPT (Blue straight fitting) using liquid Teflon paste in the outlet port of the Performer RPM Nitrous Solenoid being careful not to over tighten the fitting.
4. Remove the solenoid from the bench vise or whatever is holding the solenoid. The assembled solenoid should look like the solenoid pictured to the right.
5. Hold the Performer RPM Fuel Solenoid securely (such as in a bench vise) being careful not to harm the solenoid or block the inlet or outlet ports of the solenoid.
6. Install the fuel fitting (Red fitting 4AN x 1/4NPT) using liquid Teflon paste in the inlet port of the Performer RPM fuel fitting being careful not to over tighten the fitting.
7. Install the 4AN x 1/8NPT (Red straight fitting) using liquid Teflon paste in the outlet port of the Performer RPM Fuel Solenoid being careful not to over tighten.
8. Remove the solenoid from the bench vise or whatever is holding it.



2.5.2 Performer Solenoid Assembly

1. Hold the Performer Nitrous Solenoid securely (such as in a bench vise) being careful not to harm the solenoid or block the inlet or outlet of the solenoid.
2. Install the nitrous filter fitting (Blue filtered fitting 4AN x 1/8NPT) using liquid Teflon paste in the inlet port of the Performer Solenoid. Be careful not to over tighten the fitting causing it to strip or gaul.
3. Install the 3AN x 1/8NPT (Blue straight fitting) using liquid Teflon paste in the outlet port of the Performer Solenoid being careful not to over tighten the fitting.
4. Remove the solenoid from the bench vise or whatever is holding the solenoid. The assembly should look like the solenoid pictured to the right.
5. Hold the Performer Fuel Solenoid securely (such as in a bench vise) being careful not to harm the solenoid or block the inlet or outlet of the solenoid.
6. Install the fuel fitting (4AN x 1/8NPT) using liquid Teflon paste in the inlet port of the Performer Fuel Solenoid. Be careful not to over tighten the fitting.
7. Install the 3AN x 1/8NPT (Blue straight fitting) using liquid Teflon paste in the outlet port of the Performer Fuel Solenoid being careful not to over tighten.
8. Remove the solenoid from the bench vise or whatever is holding it.



2.6 Mounting Your Solenoids

1. Locate the universal solenoid brackets (both Performer and Performer RPM), solenoid mounting screws (you will find eight screws, four of which are for the Performer Brackets and Solenoids (8 x 32 UNC x 5/16") and four for the Performer RPM Brackets and Solenoids (10 x 32 UNC x 5/16")), and the solenoids that you assembled in the previous segment.
2. Install the Performer Solenoid assemblies on to the Performer Solenoid Brackets using the 8 x 32 UNC x 5/16" screws. Secure the screws into the solenoids using a small drop of removable thread lock on each screw.
3. Install the Performer RPM Solenoid assemblies on to the Performer RPM Solenoid Brackets using the 10 x 32 x 5/16" screws using the same method as described in the previous step.
4. Install the solenoids and brackets on the vehicle. The solenoid brackets are meant to be modified to clear almost any potential interference around the carburetor/plate mounting surfaces. Please look at the picture below and potential solenoid mounting locations and adapt your brackets according to their locations. Please keep in mind that the line lengths for the Fuel Solenoid to the plate is 8 inches and the nitrous lines are 12 inches.

Pictured to the right is an unmodified Performer RPM solenoid bracket and a modified bracket with the solenoid installed, ready for installation on an intake manifold.

The modifications can be performed by clamping the solenoid bracket in a bench vise, or by using wide jaw pliers, and carefully bending the bracket to the desired angles that you need.

The Performer solenoid brackets can be bent and shaped in the same fashion as the Performer RPM brackets pictured here.

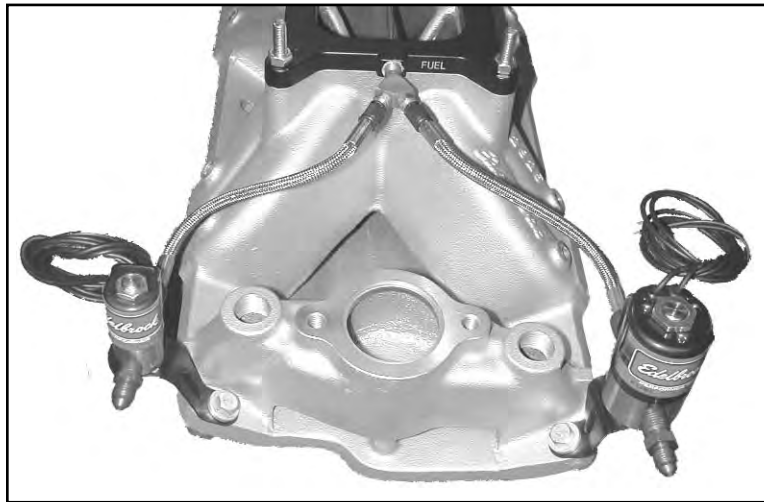


2.6 Mounting Your Solenoids (Continuation)...

Remember that there are many factors to take into account when mounting your solenoids. Make sure that you mount the solenoids within line length of the plate. Other factors or components that could potentially interfere with solenoid placement are:

- Water neck/thermostat housings
- Water fittings
- Distributor housing
- Vacuum advance canisters
- Air filter housings
- Throttle linkage passageways
- Valve covers and valve cover fasteners

Pictured below is one example of the many ways that you can mount your solenoids.



2.7 Fuel and Nitrous Y-Fittings Installation

1. Locate the two 4AN 12-inch red steel braided hoses and the red 4AN Y-Fitting supplied with this system.
2. Connect one end of one of the supplied 4AN 12-inch red hoses to the inlet of the Performer Fuel Solenoid. Connect the remaining end of this hose to the supplied 4AN red Y-Fitting.
3. Connect one end of the remaining 4AN 12-inch red hose to the inlet of the Performer RPM Fuel Solenoid. Connect the remaining end of this hose to the 4AN red Y-Fitting.
4. Determine a source for your fuel supply to the nitrous system and connect the remaining end of the red Y-Fitting to this source.
5. Locate the two 4AN 12-inch blue steel braided hoses and the blue 4AN Y-Fitting supplied with this system.
6. Connect one end of one of the supplied 4AN 12-inch blue hoses to the inlet port of the Performer Nitrous Solenoid. Connect the remaining end of this hose to the 4AN blue Y-Fitting.
7. Connect one end of the remaining 4AN 12-inch blue hose to the inlet port of the Performer RPM Nitrous Solenoid. Connect the remaining end of this hose to the 4AN blue Y-Fitting.
8. Connect the main feed line hose to the remaining 4AN fitting of the 4AN blue Y-Fitting.

2.8 Nitrous Injection Plate Installation

The Edelbrock Nitrous System injection plate is a precision-designed CNC-machined component. It has been designed to safely introduce a precise, metered nitrous and fuel signal to promote proper mixing and distribution into the intake manifold. The jet map supplied in this manual will give you the proper jet sizes to use for each of the power levels available for this plate.

The jet fittings are color-coded for use with **nitrous (blue)** and **fuel (red)**. The red Y-fitting jet holder faces the front of the engine and the blue Y-fitting jet holder faces towards the rear of the engine. The plate has been etched indicating which of the gasket surfaces faces upwards. Look at the brass tubes, a properly oriented plate will have the nitrous tube above the fuel tube ensuring the angled orifices machined into the tube face oriented to the floor of the intake manifold.

Use the following procedures to install the injector plate:

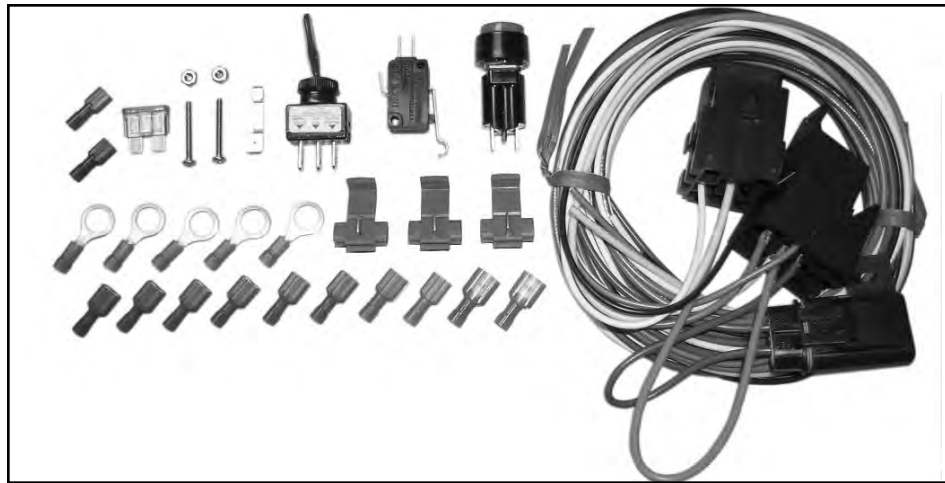
1. Remove the carburetor air cleaner.
2. Mark all vacuum lines and external connections attached to the carburetor and disconnect them.
3. Disconnect the throttle linkage from the carburetor.
4. Disconnect the fuel lines for the carburetor.
5. Remove the carburetor.
6. Remove the stock carburetor studs and clean the carburetor pad and mounting surface.
7. Install the supplied extended carburetor studs supplied with this kit (70003) or install the extended carburetor studs in the front and use the extended bolts when re-installing the carburetor on the rear of the carburetor (70004).
8. Install the injector plate and gaskets supplied with this kit on the intake manifold.
9. Install the carburetor.
10. Re-connect the linkage, all external vacuum lines and fuel lines.

Note: Every precaution has been taken to ensure the cleanliness of our components during the assembly of your Edelbrock Nitrous System. However, because of the importance of the jets and the calibration, extra care should be taken before you install your jets. Wash them thoroughly with brake cleaner or another non oil based cleaner, before installing them into the plate.

2.9 Jet and Plumbing Installation

1. Install the desired nitrous and fuel jets in the jet fittings on the Y-fittings installed in the plate. Remember that the **red Y-fitting is for fuel** and the **blue Y-fitting is for nitrous**. Mixing the jets up during installation can cause engine damage.
2. Using the 3AN 8-inch red steel braided hose, connect one end to the outlet of the Performer Fuel Solenoid. Install the fuel jet that you selected for your lower horsepower setting (50-100 HP) into one of the jet holders on the red Y-fitting and connect the remaining end of the 3AN hose to this jet holder with the jet installed.
3. Using the 4AN to 3AN 8-inch red steel braided hose, connect the 4AN end of the hose to the outlet port of the Performer RPM Fuel Solenoid. Install the fuel jet that you selected for your higher horsepower setting (100-250 HP) into the remaining jet holder on the red Y-fitting and connect the remaining end of the 4AN to 3AN hose to this fitting.
4. Using the 3AN 12-inch blue steel braided hose, connect one end to the outlet of the Performer Nitrous Solenoid. Install the nitrous jet that you selected for your lower horsepower setting (50-100 HP) into one of the jet holders on the blue Y-fitting and connect the remaining end of the 3AN hose to this jet holder with the jet installed.
5. Using the 4AN to 3AN 12-inch blue steel-braided hose, connect the 4AN end of the hose to the outlet port of the Performer RPM Nitrous Solenoid. Install the nitrous jet that you selected for your higher horsepower setting (100-250 HP) into the remaining jet holder on the blue Y-fitting and connect the remaining end of the 4AN to 3AN hose to this fitting.

3.0 Electrical System Installation



3.1 Nitrous Electrical Components Bill of Materials (BOM)


Item #	Quantity	Description
1	1 ea.	Activation microswitch
2	1 ea.	Activation microswitch bracket (not shown)
3	2 ea.	Activation microswitch mounting nut
4	2 ea.	Activation microswitch mounting screw
5	1 ea.	2 Stage 30 amp relay
6	1 ea.	Wire harness with integral relay/fuse holders
7	1 ea.	Red lighted toggle switch
8	6 ea.	18/22g female spade connector, Nylon insulated
9	2 ea.	14/16g female spade connector, Nylon insulated
10	2 ea.	14-16g male spade connector, Nylon insulated
11	3 ea.	16/18, splice connector
12	5 ea.	14/16g 3/8" ring terminal, Nylon insulated
13	1 ea.	Male blade fuse tap
14	1 ea.	14/16g male spade connector, Nylon insulated
15	1 ea.	Nitrous 2nd stage push button
16	1 ea.	20 amp ATO blade fuse
17	2 ea.	18/22g female spade connector, Nylon insulated

Nomenclature Descriptions:

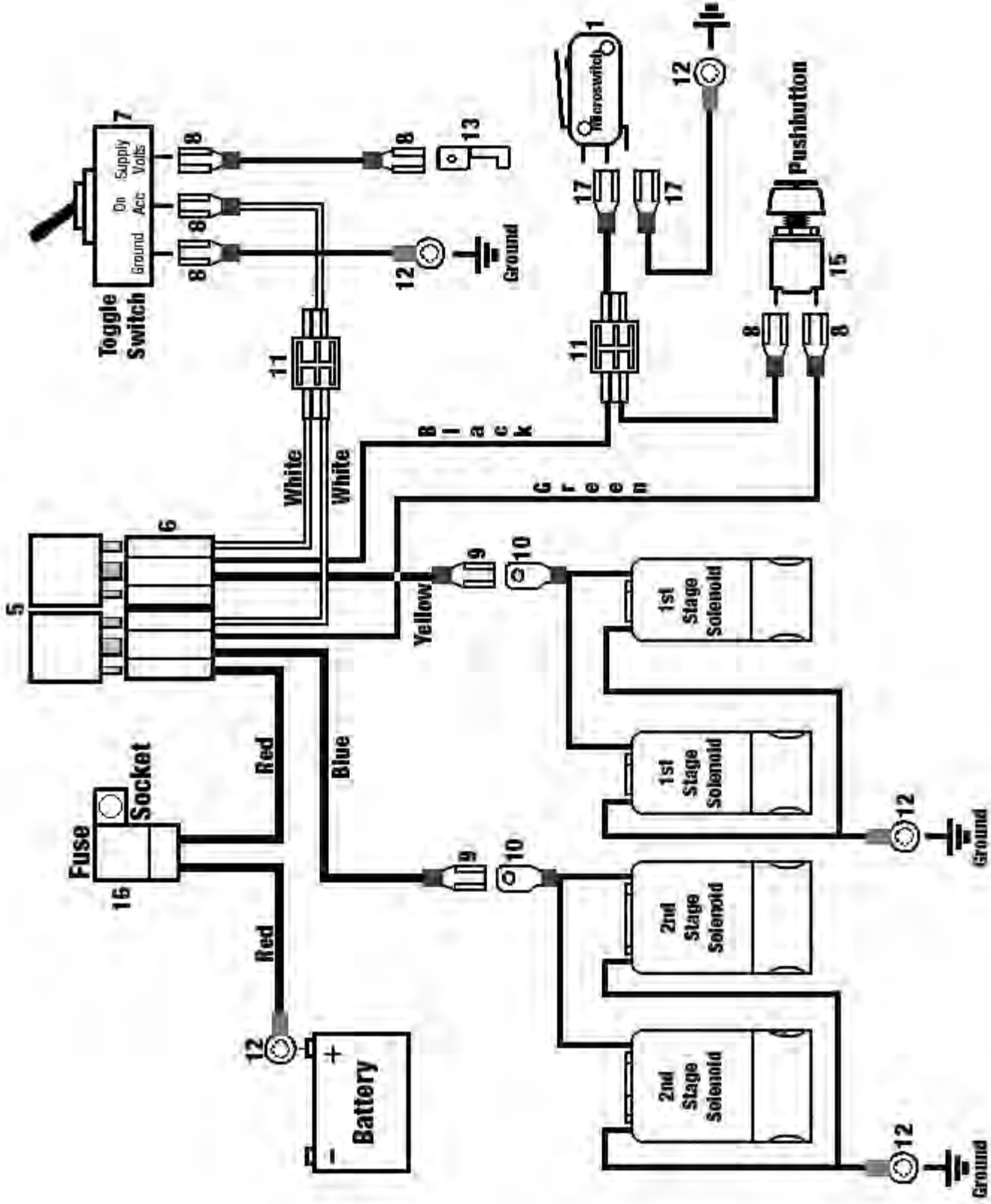
ATO... the fuse configuration is ATO. When replacing this fuse, ask for an ATO fuse.

"a"... Amperage.

Important: The wiring hardware and instructions included with this kit are intended for 12-volt electrical systems only. Before attempting to wire your Edelbrock Performer nitrous oxide system, examine and follow the wiring diagram on the following page. Please call the Edelbrock Technical department with any questions concerning electrical wiring.

	<p>When working with electrical systems in your vehicle, it is a good idea to have a service manual that features your vehicle. It is also good practice to have a book that specializes on the specialized techniques required when working with vehicular electrical systems.</p>
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3.2 Nitrous Electrical System Wiring Diagram



3.3 Nitrous Electrical System Installation Procedures

Determine the location of the relay and fuse holder wire harness. Most common installations locate these components inside the driver's compartment and close to the fuse panel under the dash. You can also mount the relay and fuse holder harness close to the battery. However, these connectors are water-resistant not waterproof, so care is required when mounting this assembly under the hood of your vehicle.

Wire Schematic Origin and Destination Map

Wire Color	System	Origin	Destination	Terminal Used
Red	Main System Bat. Voltage Arming Switch	Relay Harness	Bat. Volt. Signal	Ring
Blue	2nd Stage Functions	Relay Harness	2nd Stage Solenoids	M/F Spades
Yellow	1st Stage Functions	Relay Harness	1st Stage Solenoids	M/F Spades
Green	2nd Stage Functions	Relay Harness	2nd Stage Pushbutton	Female Spade
Black	1st Stage Functions	Relay Harness	Microswitch	Female Spade
White	Main System Arming	Relay Harness	Toggle Switch	Female Spade
White	Main System Arming	Relay Harness	White Sys. Arm Wire	Splice Connector
Red	Main System Arming	Arming Switch	Switched 12V Power	2 F Spades, Blade Conn.
Black	Main System Arming	Arming Switch	Ground	F Spade, Ring
Black	1st Stage Functions	Microswitch	Ground	F Spade, Ring
Black	1st Stage Functions	Microswitch Splice	Pushbutton	Splice, F Spade
Black	1st Stage Functions	1st Stage Solenoids	Yellow Wire	Male Spade
Black	2nd Stage Functions	2nd Stage Solenoids	Blue Wire	Male Spade
Black	1st Stage Functions	1st Stage Solenoids	Ground	Ring Terminal
Black	2nd Stage Functions	2nd Stage Solenoids	Ground	Ring Terminal

3.4 Nitrous Relay and Fuse Holder Installation

The wire harness attached to the relay and fuse holder includes 8 feet of color-coded wires to make the electrical system installation for your Edelbrock Nitrous System as easy as possible. We recommend not cutting any lengths of wires from the wire harness or complete the wiring of the nitrous system until all of the mechanical components are securely mounted in their permanent locations.

Once all of the solenoids and switches are placed, route the un-cut wires from the harness to each location allowing enough wire length on each circuit to not interfere with operating linkages, heat sources, brackets, etc. Pay particular attention to sharp edges along the route of your wire harness to prevent wire damage.

After you have accounted for the routing of your wires, follow the Wire Harness Schematic on page 15 and use the Origin and Destination Map as a guide for which electrical connectors are used in each circuit.

Once you have decided the location of the relay and fuse holder, secure them with fasteners (not included with kit) such as sheet metal screws, bolts and nuts, etc. Allow for some slack in the red wire that connects the relay and fuse holders together.

When mounting your relay and fuse holder, make sure the mounting surface is strong enough to support servicing the relay and fuse. Also, ensure you allow for some slack in the wire that joins the fuse holder to the relay mount. This will avoid any potential loss of power due to stress on the wire harness.

The fuse is covered by the fuse mount housing. The relay for the Performer system is rated for 30 amps, and the fuse is 15 amps.

3.5 Arming Switch and Installation

The arming switch is a red, lighted switch that is a “MASTER” arming switch for your nitrous system. Without it, your nitrous system would be “on” all of the time and capable of engaging anytime you go to wide-open throttle conditions with your vehicle. The switch, when in the “armed” position, is well lit. Therefore, it should be placed in an obvious position well within the line of sight and easy reach of the driver. Please refer to the procedures below for the installation of the arming switch:

1. Locate the final position of your arming switch.
2. Drill a .450” (approx. 29/64”) hole for the switch location.
3. Insert the switch from behind the mounting hole and secure with the switch nut.
4. Do not wire until all other mechanical components are in place. Please see the electrical system installation instructions for further information.

Note: There is a collar included with the switch for applications that require special spacing during installation.

3.6 Microswitch Installation and Wiring

The function of your microswitch is to enable your nitrous system. It should be installed so that the switch is forced closed by coming in contact with the throttle linkage only at the wide open throttle position. The nitrous system must only function at fully-loaded wide-open throttle.

MICROSWITCH SAFETY INFORMATION

1. **Do not** allow wiring from the microswitch to come in contact with heat sources on the intake manifold such as EGR risers or passageways.
2. **Do not** run wires to the microswitch that can create interference with the operation of the throttle linkage.
3. The microswitch must be located in such a way as to be clear of the normal operation of the throttle linkage.
4. **Do not** directly expose the microswitch to liquids such as water or gasoline.



This is a picture of an un-modified and “ready to install” microswitch assembly. The microswitch bracket has several mounting positions available for clocking of the switch. It also is of a universal length and can be attached to several positions on and around the throttle body.

3.6 Microswitch Installation and Wiring (continuation)...

The bolts used to attach the microswitch have extra length to allow for spacing the microswitch away from the bracket to offer a level of adjustability of the microswitch. After determining the position of the microswitch, we recommend trimming the bolts for a clean installation.

Due to the wide variety of throttle linkage combinations in use, it is impossible to supply a microswitch bracket custom tailored to each application. The universal bracket supplied will need to be modified to fit your specific application.

Here is a microswitch assembly mounted for use. It is an example of one of many ways in which to mount a microswitch on your carburetor. The microswitch bracket allows for many different mounting positions. The microswitch bracket can be modified to clear almost any potential interference around the throttle linkage.



The microswitch bracket supplied is drilled to permit many different switch mounting positions. This flexibility allows for the microswitch to be positioned in such a manner to engage the carburetor linkage without interfering with its normal and safe operation. The bracket may be manipulated (bent, twisted, and/or cut) to best suit your combination. Mount the microswitch on the carburetor so the actuation arm is triggered by the throttle linkage making sure that all wiring and the bracket do not interfere with the smooth and safe operation of the carburetor. Be sure the actuation arm “clicks” at the point where the carburetor is wide open.

3.7 Final Electrical Installation Recommendations

At this time, it is advised that you double-check the following areas:

1. **Double Check** all wires so that they do not come in contact with any heat sources like exhaust manifolds, and EGR crossovers, etc.
2. **Double Check** the wires that lead from the microswitch to ensure that they do not interfere with the operation of the throttle body linkage.

You are now ready to hook up your battery and prepare your vehicle to run.

4.0 Before You Run Your Vehicle Using Your Edelbrock Nitrous System

You have just completed the installation of your Edelbrock Nitrous System. It is time to perform some basic system checks to ensure all of the work you have done is correct and ready to operate properly. The following procedure is designed to validate the operation of your nitrous system before operating your vehicle:

Note: Before performing steps 1 through 4, make sure that the nitrous bottle is closed and main nitrous supply line is empty of any nitrous.

4.1 Fuel System Check

1. Hook up all battery leads.
2. Double-check all wires and leads for signs of heat and proper connections.
3. Start your vehicle.
4. Check all fuel lines and fittings for leaks.
5. Switch master arming switch to the "on" position (switch should now glow red). **Make sure the nitrous bottle is closed and the main feed line are completely empty of ANY nitrous!** Raise the engine speed to above 2000 RPM. Briefly depress the activation arm on microswitch, which will open the fuel and nitrous solenoids. Listen for a loud click or hold the solenoids while you active the microswitch. Engine speed should decrease if the fuel solenoid and delivery system are performing properly. If not, refer to "Trouble Shooting Guide".

4.2 Nitrous System Check

1. With the vehicle's engine running, slowly open nitrous bottle valve.
Note: *There should be no change in engine idle speed. If idle speed changes, close nitrous bottle valve immediately and refer to the "Troubleshooting Guide" section.*
2. Inspect nitrous lines and fittings for leaks using a soapy water mixture and a small brush.
3. If any of the fittings/connections show bubbling around the attachment nut or on the threaded area of the fitting, shut the nitrous bottle valve off immediately and dry the fitting before attempting any service to that particular fitting connection.
4. If the engine idle does not come up, and all of the fittings appear to be leak-free, you have successfully completed the installation of you Edelbrock Nitrous System.

5.0 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 like a turbocharger or supercharger. Meaning, it does not cost horsepower as a crank-driven supercharger or an exhaust-driven turbocharger.
3. Nitrous is instantaneous and there is no lag time such as what you would encounter with a 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:

5.1 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.

5.2 Fuel Pressure...Always ensure you have between 6-7 psi of fuel pressure every time you enable your nitrous system. We used 6.5 to 7 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 7 psi of fuel pressure, when it is activated, to the fuel solenoid, you would have a rich condition.

The jet map provided for your 2-Stage Performer RPM nitrous system is purposely rich, or biased to the fuel side of the nitrous to fuel ratio. 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 conservative jetting combinations, based upon 900 to 950 psi nitrous oxide bottle pressure, and 6.5 to 7 psi flowing fuel pressure. Operating with these pressure levels should yield safe and reliable power increases.

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.)

6.0 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.

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”

Testing Checklist

Suggestions on How To Perform Accurate and Repeatable Tests with a Nitrous Vehicle:

1. **Testing should be done on a dyno. Never street race - always obey all traffic laws.**
2. Always test with your vehicle when up to normal operating temperatures and operating conditions.
3. Ensure all vehicle systems and components are adjusted to proper settings (tire pressures, oil levels, coolant levels, etc.).
4. Always verify fuel pressures and nitrous pressures are the same, every time you test the vehicle. Different pressures will always yield different results.
5. Use all of your senses to determine how your vehicle is operating. Listen for detonation, watch your gauges, smell for strange odors, etc.

7.0 Solenoid Inspection and Maintenance

1. Close valve on nitrous bottle.
2. Make sure all nitrous supply lines are free of pressure before removal of any system solenoid.
 - a. Empty main nitrous supply line at the nitrous bottle. Take care to not breathe or expose your skin to nitrous.
 - b. **Do not open pressurized fuel lines over a hot engine.**
3. Remove nitrous solenoid from the engine and securely clamp it into a vise, taking great care not to damage the solenoid.
4. Remove the solenoid cover, retaining nut from top of the nitrous solenoid.
5. Remove coil and housing from nitrous solenoid base.
6. Unscrew stem from nitrous solenoid base. Do this by using a solenoid stem removal tool or by “double nutting” the stem and unscrewing the stem from the housing body. **Do not use pliers on solenoid stem;** damage to the stem will result.
7. Carefully remove the stem, spring and plunger from the solenoid base paying close attention to the way they are assembled.
8. Examine the plunger seal for swelling, cuts and abrasions. The seal surface should be flat, except for a small circular indentation in the center of the seal.

A seal that has been contaminated or over-pressurized will bulge from exposure to chemicals other than nitrous oxide. It can appear to extend down from the plunger and be dome-shaped. A contaminated seal may return to its original shape if left out in fresh air for approximately 48 hours. It may then be returned to service. If it does not return to its original shape, it must be replaced.
9. Clean the solenoid body. **Do not use an oil-based solvent to clean any part of the solenoid.** Use paint thinner or electrical contact cleaner. Remove any contaminants that may be present. Make sure solenoid body is clean, dry and free of oils before assembly.
10. Replace the O-Ring, plunger and piston spring.
11. Re-assemble solenoid by reversing disassembly procedure.

8.0 Troubleshooting Your Edelbrock Nitrous System

How to use our Troubleshooting Flowchart:

The troubleshooting of a nitrous system is basic and straightforward. The symptom chart is divided by symptom, cause and action required. Determine your problem (symptom), identify the potential problem (cause) and correct the problem (action required).

Symptom #1... There is No change in engine speed when fuel solenoid is activated.

1. System wired incorrectly.
 - a. Compare wiring to schematic.
 - i. Wire per instructions. See *"Nitrous Electrical System Wiring Diagram"* section.
2. Restricted fuel line.
 - a. Inspect fuel line for restrictions.
 - i. Remove restrictions (kinks in rubber line, pieces of rubber hanging in flow path, etc.).
 - ii. Change fuel line routing.
 - b. Check Fuel Pressure.
 - i. Increase fuel delivery as needed.
 - c. Service the nitrous system fuel filter?
 - i. Replace/clean filter.
3. Malfunctioning fuel solenoid.
 - a. Turn arming switch on, engine off. Activate microswitch, listen for the solenoids to "click". If no click is heard...
 - i. Repair/Replace solenoid.
 - ii. Check wire connections.
 - iii. Verify the power is on.
 - iv. Perform the wire "wiggle" test.

Symptom #2... Change in engine speed when nitrous bottle valve is opened.

1. Malfunctioning nitrous solenoid.
 - a. Repair/replace solenoid. See *"Solenoid Inspection and Maintenance"* section.
2. Contamination in nitrous solenoid.
 - a. Remove and inspect solenoid for dirt around seat area of plunger in solenoid.

Symptom #3... Engine runs excessively rich when system is activated.

1. Nitrous bottle valve not fully opened.
 - a. Check bottle valve.
 - i. Open valve fully.
2. Nitrous bottle mounted improperly.
 - a. Mount bottle properly. See *"Nitrous Bottle Installation"* section.
3. Plugged nitrous filter.
 - a. Clean and/or replace nitrous filter.
 - b. See nitrous solenoid symptom #2.
4. Low bottle pressure.
 - a. Weigh bottle.
 - i. Bottle should be 10 lbs. above empty bottle weight listed on bottle label when full.
 - b. Check bottle temperature.
 - i. Maintain 80 to 85 degrees of bottle surface temperature.

Symptom #4... No change in performance when system is activated.

1. System wired incorrectly.
 - a. Compare wiring to schematic.
 - i. Wire per instructions.
2. Loose ground wires.
 - a. Connect test light to battery “+” (positive) terminal. Check for continuity at grounds.
 - i. Tighten/repair loose grounds.
3. No power to arming switch.
 - a. With ignition on, connect test light to battery “-” (negative) terminal. Check for power at pole #1 on arming switch.
 - i. Repair wiring.
4. Malfunctioning arming switch.
 - a. With ignition on, turn arming switch on. Connect test light to battery “-” (negative) terminal. Check for power at red wire on arming switch.
 - i. Replace arming switch.
5. Malfunctioning microswitch.
 - a. Turn arming toggle off. Close throttle microswitch, check for continuity between microswitch wiring terminals.
 - i. Replace microswitch.
6. Inadequate nitrous supply.
 - a. Weigh bottle.
 - i. Bottle should be 10 lbs. above empty bottle weight listed on bottle label when full.
 - b. Check bottle temperature.
 - i. Maintain 80 to 85 degrees of bottle surface temperature.
 - c. Check bottle valve.
 - i. Open valve fully.
 - d. Check bottle orientation.
 - i. Mount bottle properly.
7. Mismatched nitrous/fuel jetting
 - a. Compare jetting to recommended values.
 - i. Install correct jets
 - b. Verify the number stamped in the jet match the desired power level.
 - i. Acquire the right size jets and install correct jets.
8. Excessive fuel pressure.
 - a. Perform Fuel Pressure Test Procedure.
 - b. Install fuel pressure gauge.
 - i. Regulate pressure to proper settings.
9. Loose nitrous solenoid wiring.
 - a. Inspect solenoid wiring. See “*Electrical System Installation*” section.
 - b. Consult a book concerning proper wiring methods.
10. Malfunctioning nitrous solenoid.
 - a. Inspect solenoid wiring. See “*Electrical System Installation*” section.
 - i. Repair wiring.
 - b. Inspect solenoid. See symptom #2.
 - i. Rebuild/replace solenoid.

Symptom #5... Engine detonates mildly when system is activated.

1. Excessive ignition timing.
 - a. Check timing.
 - i. Reduce timing in 2-degree increments for every 50 hp.
2. Inadequate octane fuel.
 - a. Verify what gasoline you use.
 - i. Use higher-octane fuel.
3. Spark plug heat range too high.
 - a. Verify what heat range the spark plug is, and how it functions in a high load, high performance application.
 - i. Install a performance spark plug.
 - ii. Reduce spark plug heat range.
4. Too little fuel flow.
 - a. Check pressure and flow.
 - i. Correct fuel flow to proper specification.
5. Too much nitrous flow.
 - a. Verify the size of the nitrous jet.
 - i. Install the proper nitrous jet.
 - b. Check bottle temperature and pressure.
 - i. Ensure before every nitrous usage that you only use nitrous when the temperature and pressure of your bottle are correct.

Symptom #6... Engine detonates heavily when system is activated.

Inadequate fuel delivery due to:

1. Plugged fuel filter.
 - a. Inspect fuel filter.
 - i. Clean or replace filter.
2. Crimped fuel line.
 - a. Inspect fuel line.
 - i. Replace crimped line.
3. Weak or inadequate fuel pump.
 - a. Install fuel pressure gauge. Run engine under load at wide-open throttle, with system activated.
 - i. Repair or replace fuel pump.
 - ii. Install nitrous dedicated fuel supply.

Symptom #7... High RPM misfire when system is activated.

1. Excessive spark plug gap.
 - a. Inspect spark plugs.
 - i. Set plug gap at 0.030 – 0.035 inch.
 - ii. Contact the manufacturer of your plugs for more information.
2. Weak ignition/ignition component failure.
 - a. Inspect ignition components.
 - i. Replace worn components.
 - ii. Upgrade ignition system to high performance high load capable ignition components.

Symptom #8... Vehicle surges under acceleration when system is activated.

1. Inadequate nitrous supply.
 - a. Weigh bottle.
 - i. Bottle should be 10 lbs. above empty bottle weight listed on bottle label when full.
 - b. Check bottle temperature.
 - i. Maintain 80 to 85 degrees of bottle surface temperature.
 - c. Check bottle valve.
 - i. Open valve fully
 - d. Check bottle orientation.
 - i. Mount bottle properly.