A Holley Performance Brand

NOSzle Systems

Kit Numbers: 08008NOS, 08006NOS, 08004NOS

OWNER'S MANUAL

P/N 199R10273

CONGRATULATIONS on purchasing your NOS Nitrous Oxide Injection System! Your system is composed of the highest quality components available. It should provide many miles of trouble-free performance when used correctly. If you have any questions regarding the performance of your system, call NOS Technical Service at 1-714-546-0592.

NOTICE: Installation of Nitrous Oxide Systems Inc. products signifies that you have read this document and have agreed to the terms stated within.

It is the purchaser's responsibility to follow all installation instruction guidelines and safety procedures supplied with the product as it is received by the purchaser to determine the compatibility of the product with the vehicle or the device the purchaser intends to install the product on.

Nitrous Oxide Systems Inc. assumes no responsibility for damages occurring from accident, misuse, abuse, improper installation, improper operation, lack of reasonable care, or all previously stated reasons resulting from incompatibility with other manufacturers' products.

Nitrous Oxide Systems Inc. assumes no responsibility or liability for damages incurred by the use of products manufactured or sold by Nitrous Oxide Systems Inc. on vehicles used for competition or racing.

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

NOS nitrous oxide is legal for use in most states when used in accordance with state and local traffic laws. NOS does not recommend or condone the use of its products in illegal racing activities.

NOS has not pursued California Air Research Board (CARB) exemptions for these kits, hence, they are not legal for use on pollution-controlled vehicles in California. A correctly installed NOS nitrous system should not alter the emission control performance of your vehicle under standard EPA test cycle conditions.

HAZARDS DEFINED

This manual presents step-by-step instructions that describe the process of installing your NOS Nitrous Oxide Injection System. These procedures provide a framework for installation and operation of this kit. Parts are referenced by name and number to avoid confusion. Within the instructions, you are advised of potential hazards, pitfalls, and problems to avoid. The following examples explain the various hazard levels:

WARNING! Failure to comply with instructions may result in injury or death.

CAUTION! Failure to comply with instructions may result in damage to equipment.

NOTE: This information is important, needs to be emphasized, and is set apart from the rest of the text.

HINT: These special instructions provide a handy work tip.

NITROUS OXIDE INJECTION SYSTEM SAFETY TIPS

WARNINGS

IT IS NOT LEGAL TO ENGAGE NITROUS OXIDE INJECTION SYSTEMS ON PUBLIC ROADS OR HIGHWAYS. NITROUS OXIDE INJECTION SYSTEMS ARE ONLY TO BE ENGAGED DURING SANCTIONED COMPETITION OR RACING EVENTS.

The NOSzle Kit is not intended for use on hatchback type vehicles without the use of NOS part numbers 16160NOS (External Aluminum Blow-Down Tube) and 16166NOS (Racer Safety Pressure Relief Cap).

This kit includes flexible nitrous and fuel lines for connection between the NOSzles and the distribution block(s). When installed according to the instructions in this the manual, the lines are legal for use in NHRA competition, starting in 2002.

Do not attempt to start the engine if the nitrous has been injected while the engine was not running. Disconnect the coil wire and turn the engine over with the throttle wide open for several revolutions before attempting to start. Failure to do so can result in extreme engine damage.

Never permit oil, grease, or any other readily combustible substances to come in contact with cylinders, valves, solenoids, hoses, and fittings. Oil and certain gases (such as oxygen and nitrous oxide) may combine to produce a highly flammable condition.

Never interchange nitrous and fuel solenoids. Failure to follow these simple instructions can result in extreme engine damage and/or personal injury.

Never drop or violently strike the bottle. Doing so may result in an explosive bottle failure.

Never change pressure settings of safety relief valve on the nitrous bottle valve. Increasing the safety relief valve pressure settings may create an explosive bottle hazard.

Identify the gas content by the NOS label on the bottle before using. If the bottle is not identified to show the gas contained, return the bottle to the supplier.

Do not deface or remove any markings, which are on the nitrous bottle.

Nitrous bottle valves should always be closed when the system is not being used.

Notify the supplier of any condition, which might have permitted any foreign matter to enter the valve or bottle.

Keep the valves closed on all empty bottles to prevent accidental contamination.

After storage, open the nitrous bottle valve for an instant to clear the opening of any possible dust or dirt.

It is important that all threads on the valves and solenoids are properly mated. Never force connections that do not fit properly.

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What Is Nitrous Oxide?

NITROUS OXIDE…

…Is a cryogenic gas composed of nitrogen and oxygen molecules
…Is 36% oxygen by weight
…Is non-flammable by itself
…Is stored as a compressed liquid
…Exists in two grades—U.S.P. and Nitrous Plus:

- U.S.P. is medical grade nitrous oxide; its common use is dental and veterinary anesthesia. It is also commonly used as a propellant in canned whipped cream. U.S.P. is not available to the public.
- Nitrous Plus differs from U.S.P. in that it contains trace amounts of sulphur dioxide added to prevent substance abuse. Nitrous Plus is intended for automotive applications and is available for sale to the public

In automotive applications, Nitrous Plus and fuel are injected into the engine's intake manifold, which produces the following results:

- Lowers engine intake air temperature, producing a dense inlet charge.
- Increases the oxygen content of the inlet charge (air is only 22 percent oxygen by weight).
- Increases the rate at which combustion occurs in the engine's cylinders.

Do's and Don'ts of Nitrous Oxide

DO'S

- Read all instructions before attempting to install your NOS nitrous system.
- Make sure your fuel delivery system is adequate for the nitrous jetting you have chosen. Inadequate fuel pressure or flow ***will*** result in engine damage.
- Use 14 gauge (minimum) wire when installing electrical system components.
- Use high-quality connections at all electrical joints.
- Use Teflon-based **paste** on pipe style fittings.
- Make sure your engine and related components (ignition, fuel injection system, and driveline) are in proper working condition.
- **If nitrous is accidentally injected into the engine when it is not running, remove the engine coil wire, open the throttle, and crank the engine 10 to 15 seconds before starting. Failure to do so can result in an explosive engine failure.**
- **Use your NOS nitrous system only at wide-open throttle and at engine speeds above 3000 RPM.**
- **Install a proper engine to chassis ground. Failure to do so may result in an explosive failure of the main nitrous supply line.**
- Use a high-quality fuel, as suggested in Chapter 3, Baseline Tuning Suggestions.

DON'TS

- Engage your nitrous system with the engine off. ***Severe*** engine damage can occur.
- Modify NOS nitrous systems (if you need a non-stock item, call NOS Technical Service for assistance).
- Overtighten AN type fittings.
- Use Teflon Tape on pipe threads. Pieces of Teflon tape can break loose and become lodged in nitrous or fuel solenoids or solenoid filters. Debris lodged in a nitrous or fuel solenoid can cause catastrophic engine failure.

- Use sealant of any kind on AN type fittings.
- Allow nitrous pressure to exceed 1100 psi. Excessive pressure can cause swelling or in extreme cases failure of the nitrous solenoid plunger. Solenoid plungers are designed so that pressure-induced failures will prevent the valve from operating. No leakage should occur with this type of failure.
- **Inhale nitrous oxide. Death due to suffocation can occur.**
- **Allow nitrous oxide to come in contact with skin. Severe frostbite can occur.**
- Use octane boosters that contain methanol. Fuel solenoid failure may occur, producing severe engine damage.

1.0 Introduction to your NOS Nitrous Oxide Kit

1.1 General Information

NOSzle nitrous oxide injection kits are intended to provide maximum performance and tunability in a nitrous oxide injection system. These kits are intended for stock to highly modified domestic and import V8, V6, and I4 engines with multi-point fuel injection systems or modified aftermarket cast or sheet metal intake manifolds provided with fuel injector bungs. The systems can be configured as a one-stage wet system or a two-stage dry system. For installation information contact **NOS Technical Support at 1-714-546-0592.** The installation of the NOSzles will shift the attachment point of the fuel rails by about 0.5 to 0.6 inches. Horsepower increases from these kits will vary with engine displacement and configuration.

1.2 NOSzle System Requirements

When used correctly, NOS nitrous oxide injection elevates cylinder pressures and temperatures while increasing the combustion rate. These characteristics make the engine more sensitive to detonation. To avoid detonation, the required air/fuel ratio and timing retard have to be achieved with the proper selection of fuel and nitrous jets, the adequate fuel supply at the required pressure, calibration of the ignition system, and engine component selection.

- **Fuel and Nitrous Jet Selection**

NOTE: The systems and jet selections described in this instruction manual were selected for a fuel system at 43 psi. For higher or lower pressures smaller or larger jets will have to be selected.

CAUTION! To assure accurate nitrous and fuel metering, all jets sizes below 0.020 are of the sapphire type. When replacing or ordering jet sizes for calibrations not included in these kits, make sure to order NOS sapphire jets. The part number is 13745-XXXNOS, where XXX refers to the jet size. NOS stocks funnel jet sizes from 0.008 to 0.050.

CAUTION! These kits have jets for HP gains meant for stock engines (below 125HP gain). To achieve calibrations at 43 psi, fuel pressure small size jets are required. Small jet sizes are susceptible to contamination, and it is therefore very important to clean all components before assembly and during jet optimization procedures. Ignoring cleanliness procedures could cause severe engine damage.

NOTE: Every engine is different and to obtain maximum and safe performance the jet size will have to be optimized.

In some applications, the enrichment fuel is supplied by a separate fuel pump. In such configuration, the fuel pressure could be adjusted to be run at 6 psi. If 6 psi is selected, the fuel jet selection for the desired HP gain is different to the one selected for 43 psi fuel pressure.

Table 1 should give a general starting point to select the adequate jet size for the required HP gain.

Table 1 Fuel and Nitrous Jet Selection

		Recommended Configuration			Optional Configuration	
Configuration	**Approximate Power Increase (BHP)**	**Nitrous Jetting at 950 psi**	**Fuel Jetting at 43 psi fuel pressure**		**Nitrous Jetting at 950 psi**	**Fuel Jetting at 6 psi fuel pressure**
08008NOS	100	018	010		018	018
	175	024	016		024	024
	300	032	018		032	032

		Recommended Configuration			Optional Configuration	
Configuration	**Approximate Power Increase (BHP)**	**Nitrous Jetting at 950 psi**	**Fuel Jetting at 43 psi fuel pressure**		**Nitrous Jetting at 950 psi**	**Fuel Jetting at 6 psi fuel pressure**
08006NOS	100	022	014		022	022
	150	026	016		026	026
	175	028	017		028	028

		Recommended Configuration			Optional Configuration	
Configuration	**Approximate Power Increase (BHP)**	**Nitrous Jetting at 950 psi**	**Fuel Jetting at 43 psi fuel pressure**		**Nitrous Jetting at 950 psi**	**Fuel Jetting at 6 psi fuel pressure**
08004NOS	75	022	014		022	022
	125	026	016		026	026
	150	028	017		028	028

- **Adequate Fuel Pressure and Delivery**

Most MPFI systems are designed to work at 43 psi. When system pressures are regulated to higher pressure settings, the fuel pump output can severely be affected. As a general rule to calculate the fuel pump requirement divide the HP rating of your engine (base HP plus additional HP gains from your nitrous system) by the factor 10. For example, if the base engine is capable of generating 200 HP and the chosen nitrous calibration is an additional 100HP the pump must be able to generate (200+100)/10= 30 GPH at fuel system pressure.

- **Fuel System Configuration**

There are two ways the fuel system can be configured:

- Enrichment fuel supplied through the existing MPFI system
- Enrichment fuel supplied through an independent fuel supply system

Unless the fuel system has been upgraded for race applications, the fuel enrichment supply in system configurations below 125HP can be achieved by tapping into the existing pressurized fuel supply as long as the fuel pump is capable of maintaining the required system pressure and flow. In system configurations above 125HP it is strongly suggested to run an independent fuel supply system. The fuel pump, regulator and fuel lines must be sized accordingly to supply the required fuel flow and pressure for the chosen HP gain. The independent fuel system should be provided with a 10-20 micron fuel filter to avoid potential contamination of the fuel jets. The fuel filter should be installed after the independent fuel pump. For suggestions on how to layout a fuel system see Figures 16 and 17 or contact **NOS Technical Support at 1-714-546-0592.**

CAUTION: Be sure your fuel pump, fuel filter, fuel lines, and regulator are capable of handling the fuel requirements of this system. Inadequate fuel delivery will result in catastrophic engine failure.

- **Recommended Engine and System Upgrades for High Horsepower Applications**

  - **Forged Pistons**

  Cast or hypereutectic pistons are very prone to failure at elevated cylinder temperatures and pressures. Therefore forged piston are recommended.

  - **Connecting Rods**

  Standard forged connecting rods tend to buckle under the high compressive loads generated with large doses of nitrous oxide. For most applications, an aftermarket steel billet rod is acceptable. For extremely high output applications, aluminum connecting rods are suggested.

  - **Crankshaft**

  Stock cast crankshafts may break. Stock forgings can bend or twist in high output applications. Aftermarket units are recommended for very high output applications.

  - **Cylinder Block**

  Four bolt main cap blocks reduce the tendency for the main caps to “walk” under high output loading. Cylinder head studs decrease the chance of cylinder heads lifting or moving relative to the deck surface.

  - **High Output Ignition System**

  Stock ignition systems are prone to producing misfires at high-RPM conditions. A quality aftermarket racing ignition is suggested. Ignition systems with switch or rpm activated ignition retard are recommended for this application.

1.3 Kit Components

Before beginning the installation of your NOS kit, compare the components in your kit with those shown in Figure 1 and listed in Table 2, 3, or 4. If any components are missing, please contact **NOS Technical Support at 1-714-546-0592.**

Table 2 Kit Number 08008NOS Parts List (V8 engine application)

Item	Description	Quantity	NOS P/N
(1)	Bottle Nut Adapter	1	16230-SNOS
(2)	Bottle Valve Washer	1	16210-SNOS
(3)	#10 Nitrous Bottle	1	14745NOS
(4)	Bottle Mounting Bracket, Short	1	14126-SNOS
(5)	Bottle Mounting Bracket, Long	1	14127-SNOS
(6)	N_2O Super Pro Shot Solenoid	2	16045NOS
(7)	Cheater Fuel Solenoid	2	16050NOS
(8)	1/8" NPT * 4AN Fuel Filter	2	15571NOS
(9)	¼" NPT * 6AN Nitrous Filter	2	15564NOS
(10)	1/16" NPT Distribution Block	4	16715NOS
(11)	1/16" NPT x 1/8" Compression Fitting	16	16430NOS
(12)	1/8" NPT-1/8" NPT 90^o Fitting	4	17530NOS
(13)	1/8" Tube Cone Ferrule	16	16404NOS
(14)	3AN-1/8" Tube Nut Blue	8	17540NOS
(15)	3AN-1/8" Tube Nut Red	8	17541NOS
(16)	Solenoid Bracket	4	16500NOS
(17)	NOSzle Assembly	8	08001NOS
(18)	High-Pressure Line	1	16260NOS
(19)	0.010" Precision Funnel Jet	8	13745-10NOS
(19)	0.016" Precision Funnel Jet	8	13745-16NOS
(19)	0.018" Precision Funnel Jet	8	13745-18NOS
(19)	0.024" Funnel Jet	8	13755-24NOS
(19)	0.032" Funnel Jet	8	13755-32NOS
(20)	6AN *18 inches Braided Hose Blue	2	15405NOS
(21)	4AN *18 inches Braided Hose Red	2	15221NOS
(22)	6AN * 6AN * 6AN Y Fitting Blue	1	17835NOS
(23)	4AN * 4AN * 4AN Y Fitting Red	1	17831NOS
(24)	6AN 14 ft. N_2O Hose	1	15475NOS
(25)	Microswitch and Bracket	1	15640NOS
(26)	Toggle Arming Switch	1	15600NOS
(27)	Relay—30 amp**	1	15618NOS

Table 3 Kit Number 08006NOS Parts List (V6 and I6 engine application)

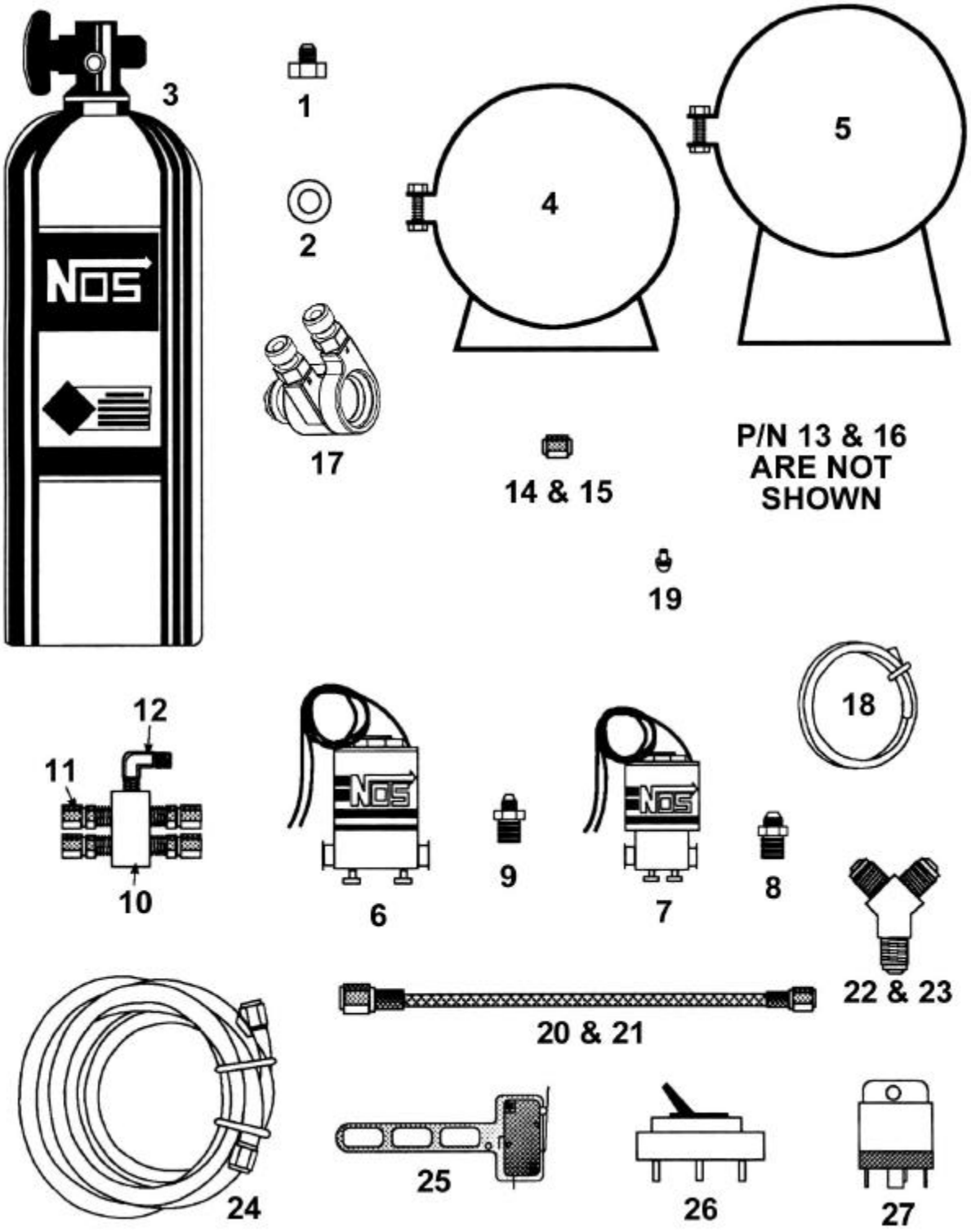
Item	Description	Quantity	NOS P/N
(1)	Bottle Nut Adapter	1	16220-SNOS
(2)	Bottle Valve Washer	1	16210-SNOS
(3)	#10 Nitrous Bottle	1	14745NOS
(4)	Bottle Mounting Bracket, Short	1	14126-SNOS
(5)	Bottle Mounting Bracket, Long	1	14127-SNOS
(6)	N_2O Super Pro Shot Solenoid	1	16045NOS
(7)	Cheater Fuel Solenoid	1	16050NOS
(8)	1/8" NPT * 4AN Fuel Filter	1	15571NOS
(9)	¼" NPT * 4AN Nitrous Filter	1	15560NOS
(10)	1/16" NPT Distribution Block	2	16725NOS
(11)	1/16" NPT x 1/8" Compression Fitting	12	16430NOS
(12)	1/8" NPT-1/8" NPT 90^0 Fitting	2	17530NOS
(13)	1/8" Tube Cone Ferrule	12	16404NOS
(14)	3AN-1/8" Tube Nut Blue	6	17540NOS
(15)	3AN-1/8" Tube Nut Red	6	17541NOS
(16)	Solenoid Bracket	2	16500NOS
(17)	NOSzle Assembly	6	08001NOS
(18)	High-Pressure Line	1	16260NOS
(19)	0.014" Precision Funnel Jet	6	13745-14NOS
(19)	0.016" Precision Funnel Jet	6	13745-16NOS
(19)	0.017" Precision Funnel Jet	6	13745-17NOS
(19)	0.022" Funnel Jet	6	13755-22NOS
(19)	0.026" Funnel Jet	6	13755-26NOS
(19)	0.028" Funnel Jet	6	13755-28NOS
(20)	4AN 14 ft. N_2O Hose	1	15295NOS
(21)	Microswitch and Bracket	1	15640NOS
(22)	Toggle Arming Switch	1	15600NOS
(23)	Relay—30 amp**	1	15618NOS

Table 4 Kit Number 08004NOS Parts List (I4 engine application)

Item	Description	Quantity	NOS P/N
(1)	Bottle Nut Adapter	1	16220-SNOS
(2)	Bottle Valve Washer	1	16210-SNOS
(3)	#10 Nitrous Bottle	1	14745NOS
(4)	Bottle Mounting Bracket, Short	1	14126-SNOS
(5)	Bottle Mounting Bracket, Long	1	14127-SNOS
(6)	N_2O Super Pro Shot Solenoid	1	16045NOS
(7)	Cheater Fuel Solenoid	1	16050NOS
(8)	1/8" NPT * 4AN Fuel Filter	1	15571NOS
(9)	¼" NPT * 4AN Nitrous Filter	1	15560NOS
(10)	1/16" NPT Distribution Block	2	16715NOS
(11)	1/16" NPT x 1/8" Compression Fitting	8	16430NOS
(12)	1/8" NPT-1/8" NPT 90^0 Fitting	2	17530NOS
(13)	1/8" Tube Cone Ferrule	8	16404NOS
(14)	3AN-1/8" Tube Nut Blue	4	17540NOS
(15)	3AN-1/8" Tube Nut Red	4	17541NOS
(16)	Solenoid Bracket	2	16500NOS
(17)	NOSzle Assembly	4	08001NOS
(18)	High-Pressure Line	1	16255NOS
(19)	0.014" Precision Funnel Jet	4	13745-14NOS
(19)	0.016" Precision Funnel Jet	4	13745-16NOS
(19)	0.017" Precision Funnel Jet	4	13745-17NOS
(19)	0.022" Funnel Jet	8	13755-22NOS
(19)	0.026" Funnel Jet	8	13755-26NOS
(19)	0.028" Funnel Jet	2	13755-28NOS
(20)	4AN 14 ft. N_2O Hose	1	15295NOS
(21)	Microswitch and Bracket	1	15640NOS
(22)	Toggle Arming Switch	1	15600NOS
(23)	Relay—30 amp**	1	15618NOS

Figure 1 Kit Number 08008NOS Components.

NOTE: This view only displays the components for the 08008NOS kit. Parts and components for the 08006NOS and 08004NOS are similar and maybe less in quantity as they pertain for 6 or 4 cylinder applications.



2.0 Kit Installation—Bottle Mounting

2.1 Bottle Mounting Instructions

NOTE: Disconnect the battery ground before beginning installation.

Before mounting a nitrous bottle in a racing vehicle intended for use in sanctioned events, check with the sanctioning association for any rules regarding this subject. Most associations require the bottle to be mounted within the confines of the safety roll cage with the safety pressure relief cap vented away from the driver's compartment. NOS offers a special safety pressure relief cap (P/N 16166NOS) and an aluminum blow-down tube (P/N 16160NOS) for this purpose.

Figure 2 Nitrous Bottle Siphon Tube Orientation

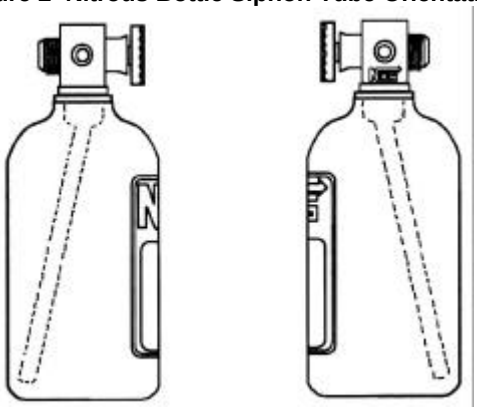
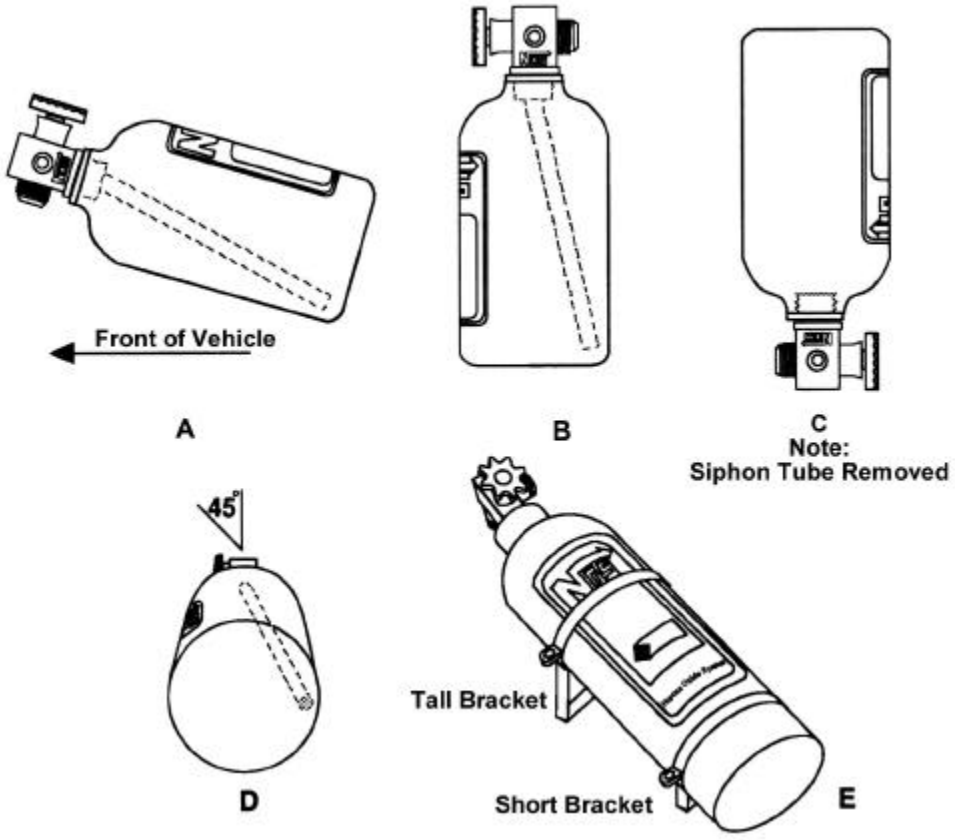


Figure 3 Nitrous Bottle Mounting Orientations



2.2 Bottle Orientation

Bottle placement is critical to the performance of your NOS 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 NOS nitrous bottles are assembled so that the bottom of the siphon tube is at the bottom of the bottle and opposite the bottle label (Figure 2).

Whenever the bottle is mounted in a lay-down position, the valve handle must be towards the front of the vehicle with the label facing up (Figure 3A).

If the bottle is mounted vertically, the valve handle and label must face toward the front of the vehicle (Figure 3B). This orientation will position the siphon tube at the back of the bottle where the liquid N_2O will be during acceleration.

WARNING! DO NOT attempt to remove the siphon tube without completely emptying the bottle of all nitrous and pressure. Failure to completely empty the bottle will result in an explosive condition causing injury or death.

A bottle mounted upside-down must have the siphon tube removed before use (Figure 3C). Non-siphon bottles can be specially ordered from NOS.

If the bottle must be mounted parallel to the axles of the vehicle (sideways), the valve handle and label must be angled at approximately 45° toward the front of the vehicle (Figure 3D). This orientation will position the siphon tube toward the rear of the bottle.

NOTE: When using a bottle with a siphon tube, the tall bracket should be at the valve end of the bottle and the short bracket at the bottom (Figure 3E).

The most efficient mounting is the lay-down position (Figure 3A) 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 Bottle Installation

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

1. Install the bottle nut adapter and washer on the nitrous bottle, and tighten securely.

2. Loosely install the bottle mounting brackets on the nitrous bottle.

3. Locate the bottle assembly in the desired mounting location, ensuring that the location will provide easy access to the bottle valve, hose connection, and bracket clamp bolts to facilitate bottle changing.

4. Use the assembled bottle/bracket/blow-down tube unit as a pattern to mark hole drilling. Drill four 5/16” holes for the bottle bracket bolts, a 1/2” hole for the blow-down tube, if used, and a 13/16” hole for the nitrous supply line.

CAUTION! When drilling or punching holes for fasteners, wires, fuel or nitrous line be aware what components, wires harness, or hoses are located or routed behind the general area to avoid vehicle or equipment malfunction

5. Mount the brackets securely to the surface (recommended minimum of 5/16” bolts).

6. Tighten the bracket clamps on the bottle.

3.0 Kit Installation (Kit Numbers 08008NOS, 08006NOS, & 08004NOS)

Figure 4 Eight Cylinder Kit Number 08008NOS (similar to the V6 application Kit Number 08006NOS)

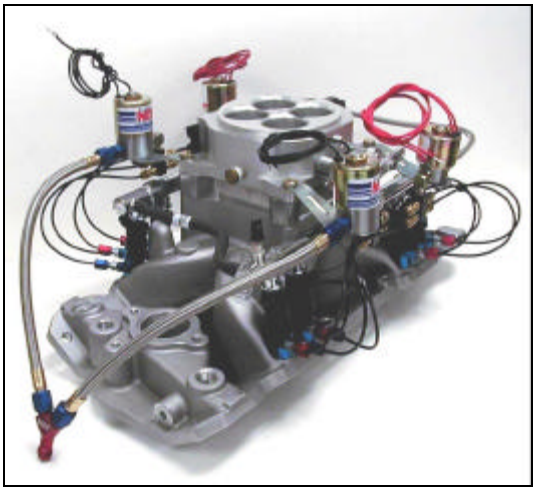


Figure 5 V8 System Diagram

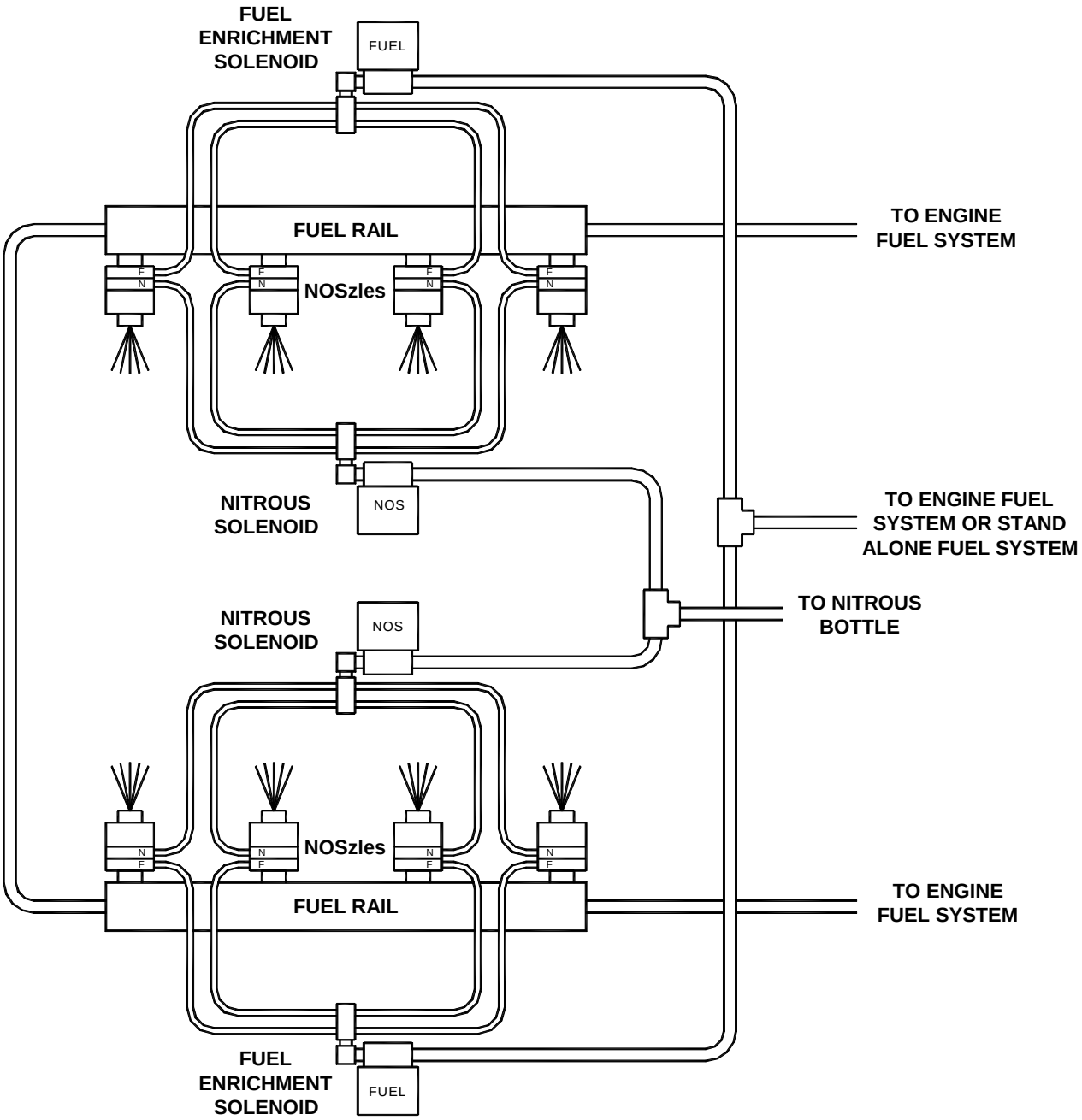


Figure 6a V6 System Diagram

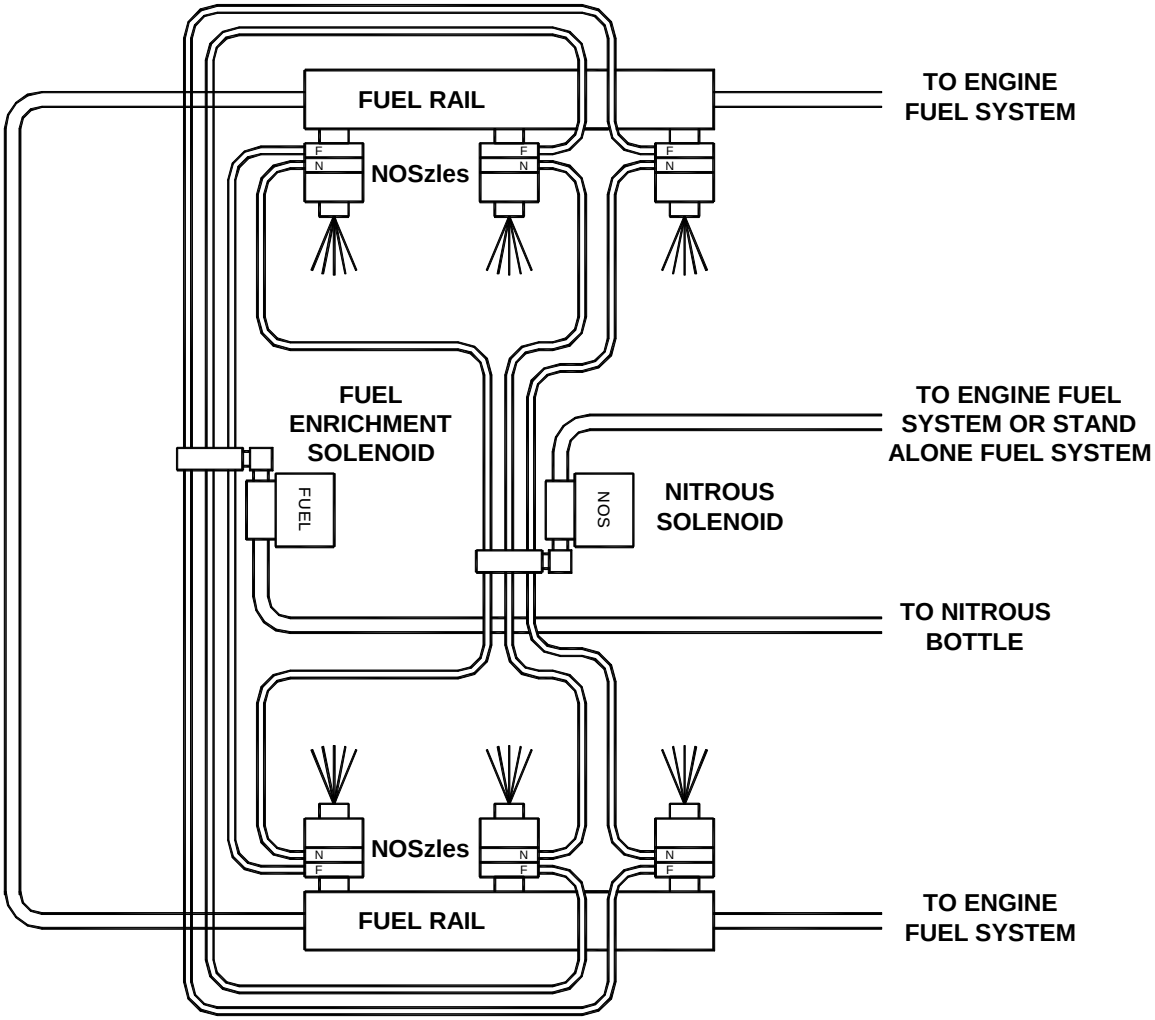


Figure 6b I6 System Diagram

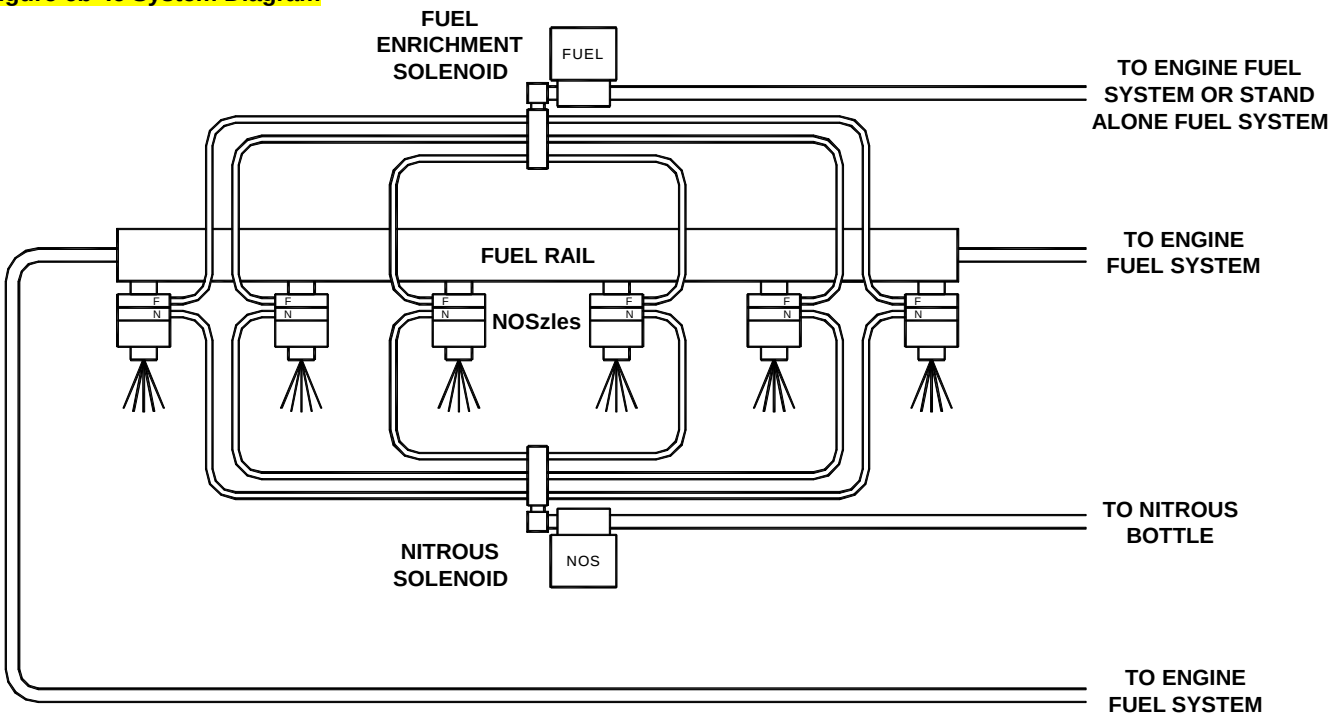
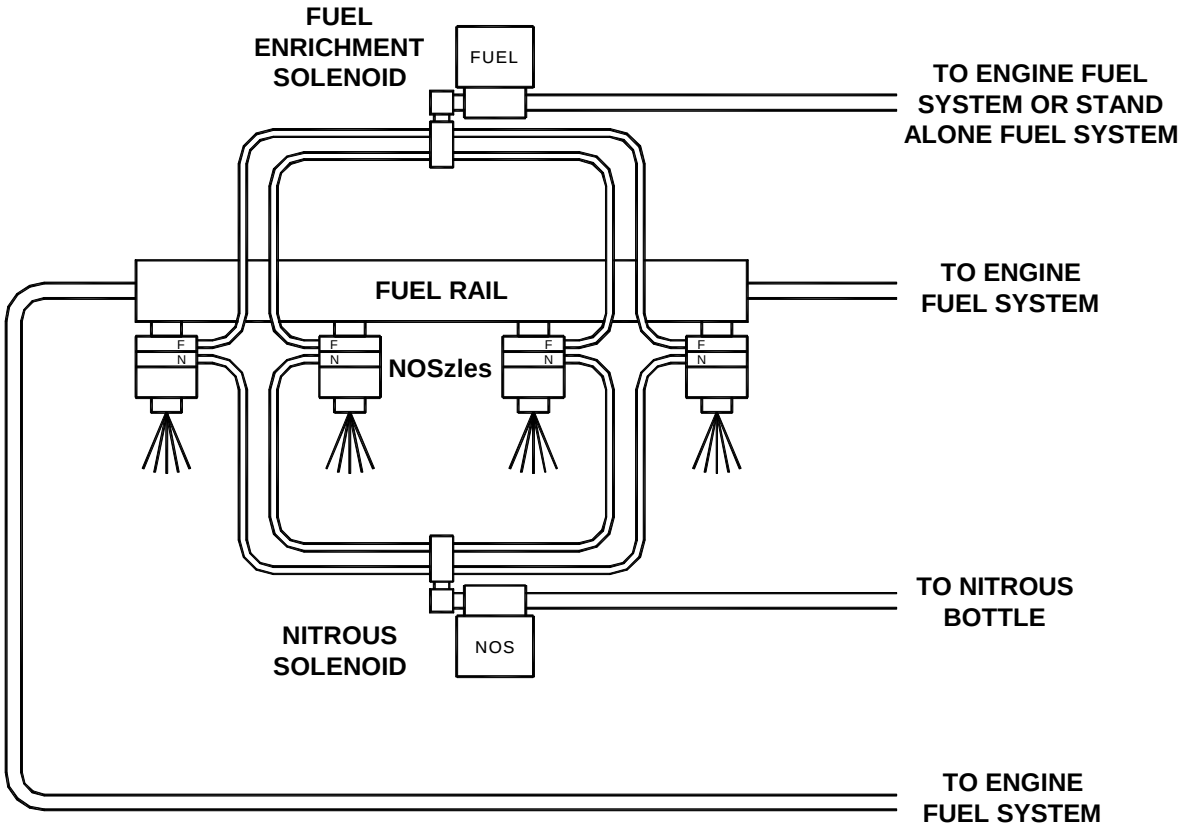


Figure 7 Four Cylinder Kit Number 08004NOS

Figure 8 I4 System Diagram



NOTE: The installation procedure below describes the installation of the 08008NOS kit. For V6 and I4 engines not all components are similar but in general the same procedure applies.

NOTE: This kit has been provided with high-pressure flexible fuel and nitrous oxide lines to reduce the installation complexity and to avoid sharp change in flow direction. These lines have been approved by NHRA and can be used in any NHRA sanctioned racing events. Make sure that when replacing high-pressure lines you only use the high-pressure lines approved by NHRA. If steel lines are preferred, please contact **NOS Technical Support at 1-714-546-0592.**

3.1 Solenoid and Distribution Block Assembly

Figures 9, 10, and 11 display the solenoid/distribution block assembly. Make sure that all components are clean before assembly. The recommended assembly procedure is the following:

Figure 9 Solenoid/Distribution Block Assembly for 8 Cylinder Application

Figure 10 Solenoid/Distribution Block Assembly for 6 Cylinder Application

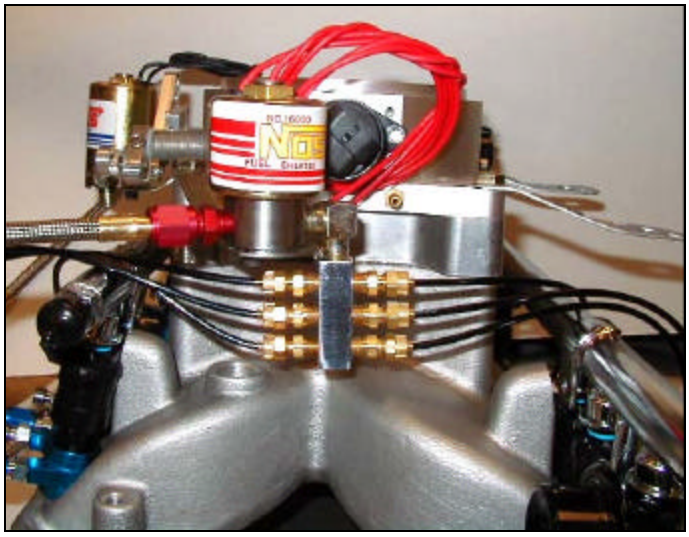
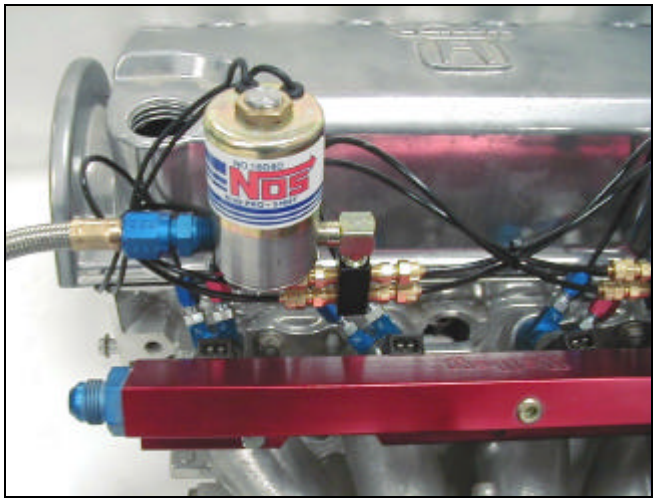


Figure 11 Solenoid/Distribution Block Assembly for 4 Cylinder Application



- Assemble the 4 (6 for 6 cylinder and 4 for 4 cylinder application) compression fittings into each of the 4 distribution blocks (two for the 6 and 4 cylinder application). Use Teflon paste to assure a good seal between the threads and the distribution block. Use Teflon paste sparingly as excess could block off flow passages causing engine malfunction. Make sure that each fitting is installed into the block to equal depths to avoid fuel or nitrous distribution problems.

3.1.1 Nitrous Solenoid Assembly (See Figures 9, 10, or 11)

1. Clamp the nitrous solenoid in a bench vise.

CAUTION! When using the vise to install the fittings in the solenoids, do not over-tighten the vise or the solenoid will be damaged

2. Loosely install the 90° fitting into the outlet port of the nitrous solenoid.

3. Loosely install the nitrous filter fitting into the inlet port of the nitrous solenoid.

4. To obtain a general view of how the components will be assembled and attached to engine components, trial fit the solenoid, nitrous filter, and 90° fitting in the nitrous distribution block. Note the orientation of the fitting and solenoid. Disassemble the 90° fitting, nitrous filter, solenoid, and distribution block.

5. Reassemble the solenoid, 90° fitting, nitrous filter, and distribution block using the Teflon paste. Tighten the connections to attain the desired mounting orientation.

6. Repeat steps 1-5 for the other cylinder bank (if applicable).

3.1.2 Fuel Solenoid Assembly (See Figures 9, 10, or 11)

1. Clamp the fuel solenoid in a bench vise.

CAUTION! When using the vise to install the fittings in the solenoids, do not over-tighten the vise or the solenoid will be damaged.

2. Loosely install a 90° fitting into the outlet port of the fuel solenoid.

3. Install the red 1/8" NPT x 6AN fitting and the 90° fitting in the fuel distribution block. Note the orientation of the solenoid and fittings. Disassemble the 90° fitting, solenoid, and distribution block.

4. To obtain a general view of how the components will be assembled and attached to engine components, trial fit the solenoid, red 1/8" NPT x 6AN fitting, and 90° fitting in the fuel distribution block. Note the orientation of the fittings and solenoid. Disassemble the 90° fitting, solenoid, and distribution block.

5. Reassemble the solenoid, 90° fitting, and distribution block using Teflon paste. Tighten the connections to attain the desired mounting orientation.

6. Repeat steps 1-5 for the other cylinder bank (if applicable).

- For 6 and 8 cylinder applications, attach each solenoid/distribution block assembly to each of the corners of the throttle body flange by using the solenoid brackets. The exact position of the solenoids on the manifold is a function of the intake manifold and throttle linkage configuration. Choose a location that is close to the injectors and provides a simple high-pressure flexible line routing described in the next installation steps. See Figure 14 for the 6 and 8 cylinder applications. For 4 cylinder applications, attach the solenoid/distribution block assembly to the valve cover bolts or any other appropriate location trying to maintain the distribution block-to-NOSzle distance to a minimum. See Figure 15 for 4 cylinder applications.

WARNING! Orientation and location of the solenoid/distribution block assembly should not interfere with the free movement of the throttle linkage or the transmission kick-down linkage.

3.2 NOSzle Installation

Figures 12 and 13 display the general installation of the NOSzle. Lubricate the o-rings of the NOSzles and install the NOSzle into the fuel injector bosses orienting the nitrous and fuel fittings straight outwards or at an angle. Use SAE 10W-30 engine oil or equivalent to lubricate the o-rings.

NOTE: The installation of the NOSzle will raise the height of the fuel rail by 0.5 to 0.6 inches. The displacement of the fuel rail will require the fabrication of special fuel rail bosses, acquisition of longer bolts, or modification of existing fuel rail bosses.

Figure 12 Eight Cylinder and Six Cylinder NOSzle Installation

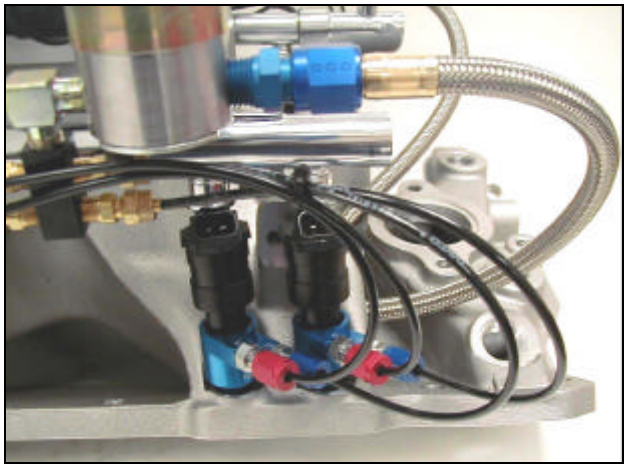
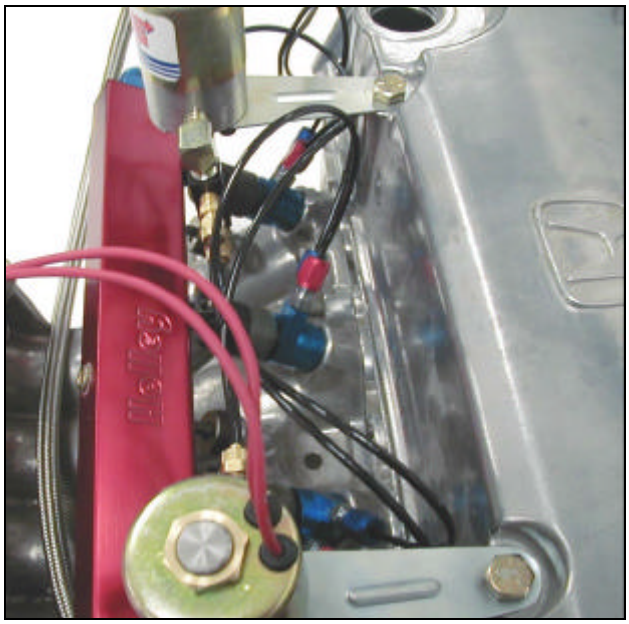


Figure 13 Four Cylinder NOSzle Installation



3.3 High-Pressure Flexible Nitrous and Fuel Line Assembly and Installation.

Figures 12 and 13 (above) display one option on how to route the high-pressure flexible lines. The recommended assembly procedure is the following:

1. Once the location of the solenoid/distribution block have been established, identify the longest distance from any fuel or nitrous fitting on a distribution block to the fuel or nitrous fitting on its NOSzle.

2. The kit includes a roll of high-pressure flexible line. Cut the high-pressure flexible line to a length that allows smooth bends from the fitting to the NOSzle.

NOTE: Use a sharp **hose cutter or razor knife** to cut the line to the desired length. Make sure that the cut is burr-free and perpendicular to the line length.

WARNING! Do not use wire cutters, side cutters or dull hose cutters as they collapse the cut end of the hose causing engine performance degradation or failure.

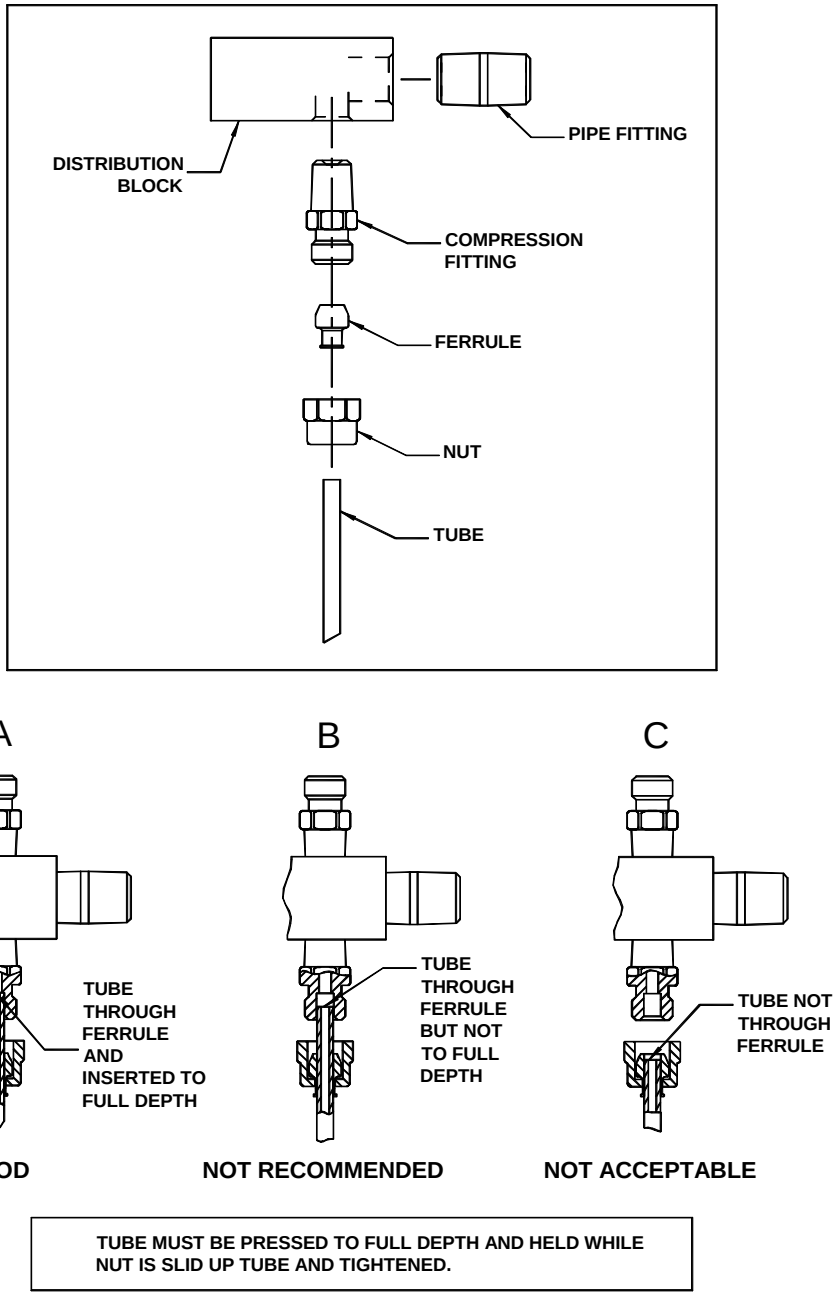
3. Cut 16 high-pressure flexible lines according to the first measured sample. (12 lines for 6 cylinder engine application and 8 lines for 4 cylinder engine application.

NOTE: Before assembling the high-pressure lines, be sure to remove any debris left from cutting and deburring by blowing clean pressurized air through each line.

3.3.1 High-Pressure Flexible Line Assembly Distribution Block End

4. Install the hose in the distribution block fitting by pushing the line through the cap until reaching a positive stop. While holding the line in such condition tighten the fitting. The fitting should be finger tightened and then an additional 3/4 turn. In Figure 14 see sketches A, B, C for optimum, adequate and inadequate high-pressure line insertion. The ¾ turn procedure should only be used for first installation of lines to conform the ferrule to the jet. During jet optimization or maintenance procedures where the high-pressure lines are disconnected 1/16 to 1/8 of a turn should suffice to obtain a leak proof connection.

Figure 14 Distribution Block, Compression Fitting, & High-Pressure Line Assembly



WARNING! Do not over tighten the fitting, as it will constrict the flow of the line at the ferrule. Tube constriction can cause engine performance degradation or failure.

5. Install the funnel jet (fuel and nitrous) selected for the particular HP gain.

WARNING! Failure to install the nitrous and/or fuel jet will result in catastrophic engine damage.

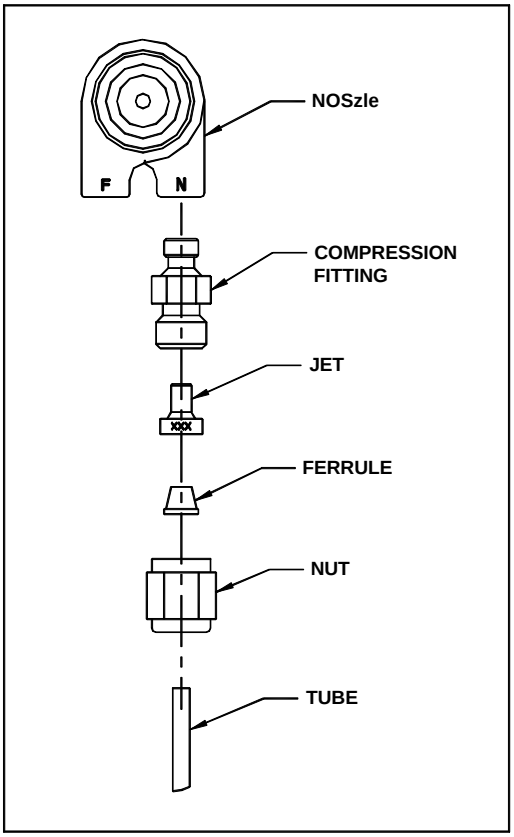
5. Insert the B-nut on the various high-pressure lines (red B-nuts for the fuel line and blue B-nuts for the nitrous lines).

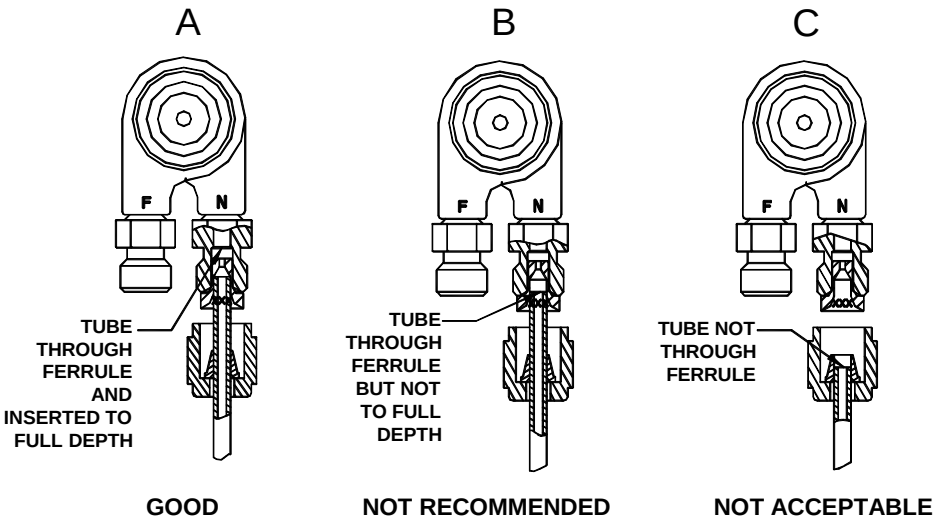
6. Insert the conical ferrule on the high-pressure line (cone towards the tip of the line).

3.3.2 High-Pressure Flexible Line Assembly NOSzle End

7. Assemble the hose to the NOSzle fitting by pushing the free end of the line into the funnel jet. Tighten the B nut while keeping the high-pressure line pushed into the funnel jet. In Figure 15 see sketches A, B,C for optimum, adequate and inadequate high-pressure line insertion. Tighten the B nut 3/4 of a turn after a finger-tight condition is achieved. The ¾ turn procedure should only be used for first installation of lines to conform the ferrule to the jet. During jet optimization or maintenance procedures where the high-pressure lines are disconnected 1/16 to 1/8 of a turn should suffice to obtain a leak proof connection.

Figure 15 NOSzle, Compression Fitting, & High-Pressure Line Assembly





TUBE MUST BE PRESSED TO FULL DEPTH AND HELD WHILE NUT IS SLID UP TUBE AND TIGHTENED.

WARNING! Do not overtighten the fitting, as it will constrict the flow of the line at the ferrule. Tube constriction can cause engine performance degradation or failure.

8. Use zip-ties to contain the high-pressure lines in a certain location and/or configuration. Avoid short bends or kinks of the high-pressure lines. Keep the lines away from heat sources such as the EGR valve, crossover passages, etc. Keep them away from sharp edges, or line failure may result.

WARNING! Kinked nitrous and/or fuel lines can result in inadequate mixture distribution resulting in catastrophic engine failure.

3.4 Main Nitrous Feed Line Installation

HINT: Most late-model vehicles have access plugs in the trunk floor that are convenient for line routing. Follow the fuel lines along the underbody, and enter the engine bay through the front fender well.

CAUTION! If drilling or punching holes is required when routing the main nitrous line, be aware what components, wires, harnesses, or hoses are located or routed behind the general area to avoid vehicle or equipment malfunction. Use a rubber grommet to avoid nitrous line damage.

1. Determine the route for your nitrous feed line to follow. Ensure that the path is clear of exhaust system, suspension, steering, wheels, electrical lines and components, and tires.

2. Feed the main nitrous supply line along the proposed route.

3. If it is necessary to support the nitrous supply line under the vehicle, use 1/2" Tinnerman clamps to support the line securely.

4. Attach the nitrous supply line to the nitrous bottle valve adapter.

5. Purge the nitrous supply line.
   A. Wrap the end of the nitrous line with a rag and hold securely.
   B. Point the opening **away** from people.
   C. Briefly open the bottle valve to clean potential debris from the line.

6. Attach the nitrous supply line to:

   A. Nitrous "Y" blue fitting in V8 engine configuration
   B. Nitrous AN blue inlet fitting in 6 and 4 cylinder applications

3.5 Fuel Solenoid Feed Line Installation

Attach the main fuel enrichment line to:

   A. Fuel "Y" red fitting in V8 engine configuration
   B. Fuel AN red inlet fitting in 6 and 4 cylinder applications

3.6 Main Fuel Line Installation Tips

Figures 16 and 17 show a basic layout of a tapped and independent fuel enrichment systems. For suggestions on how to layout a fuel system call **NOS Technical Support at 1-714-546-0592.**

NOTE: Before assembling the fuel enrichment lines, be sure to remove any contaminants by blowing clean pressurized air through each line.

Figure 16 Tapped Fuel Enrichment System Diagram

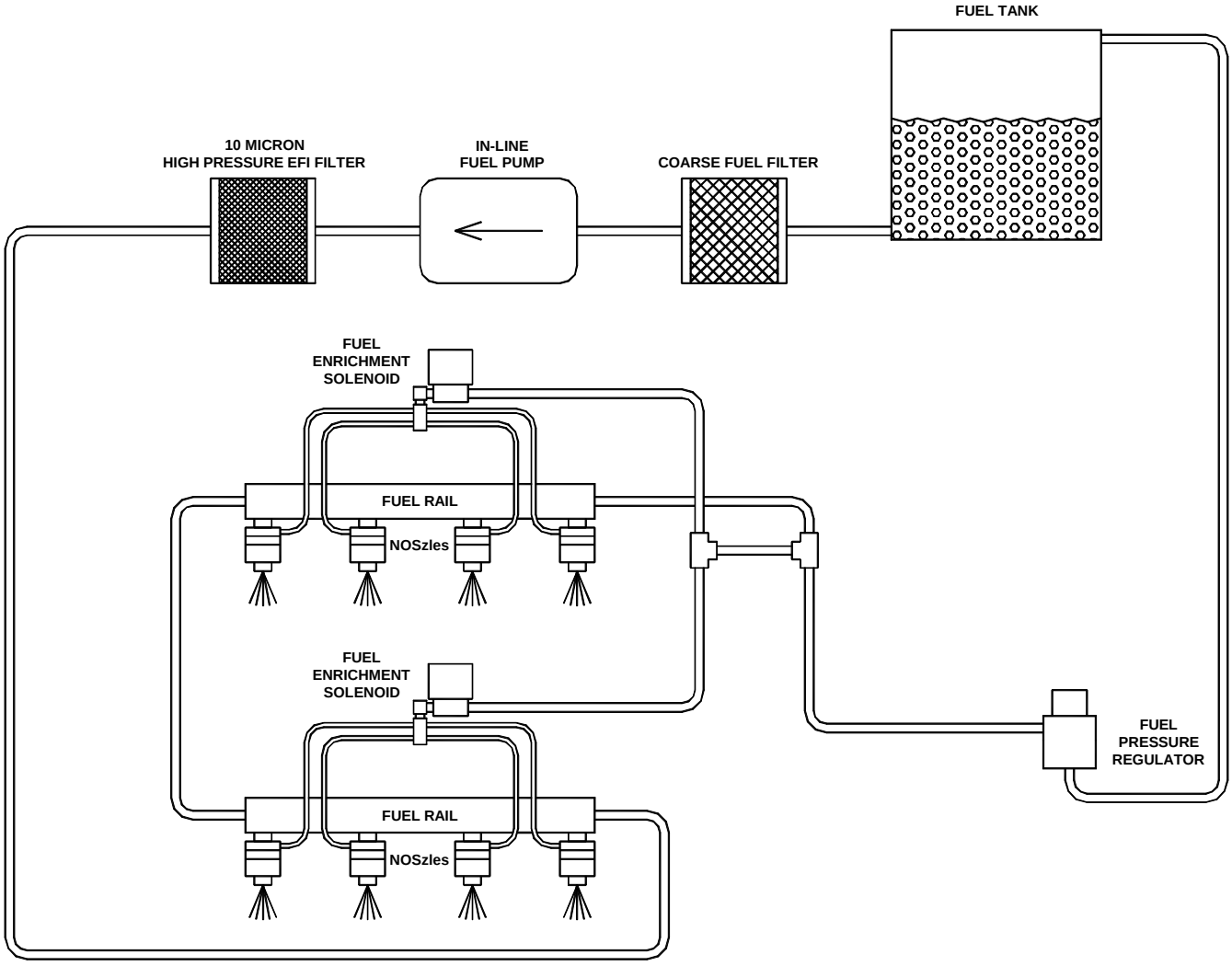
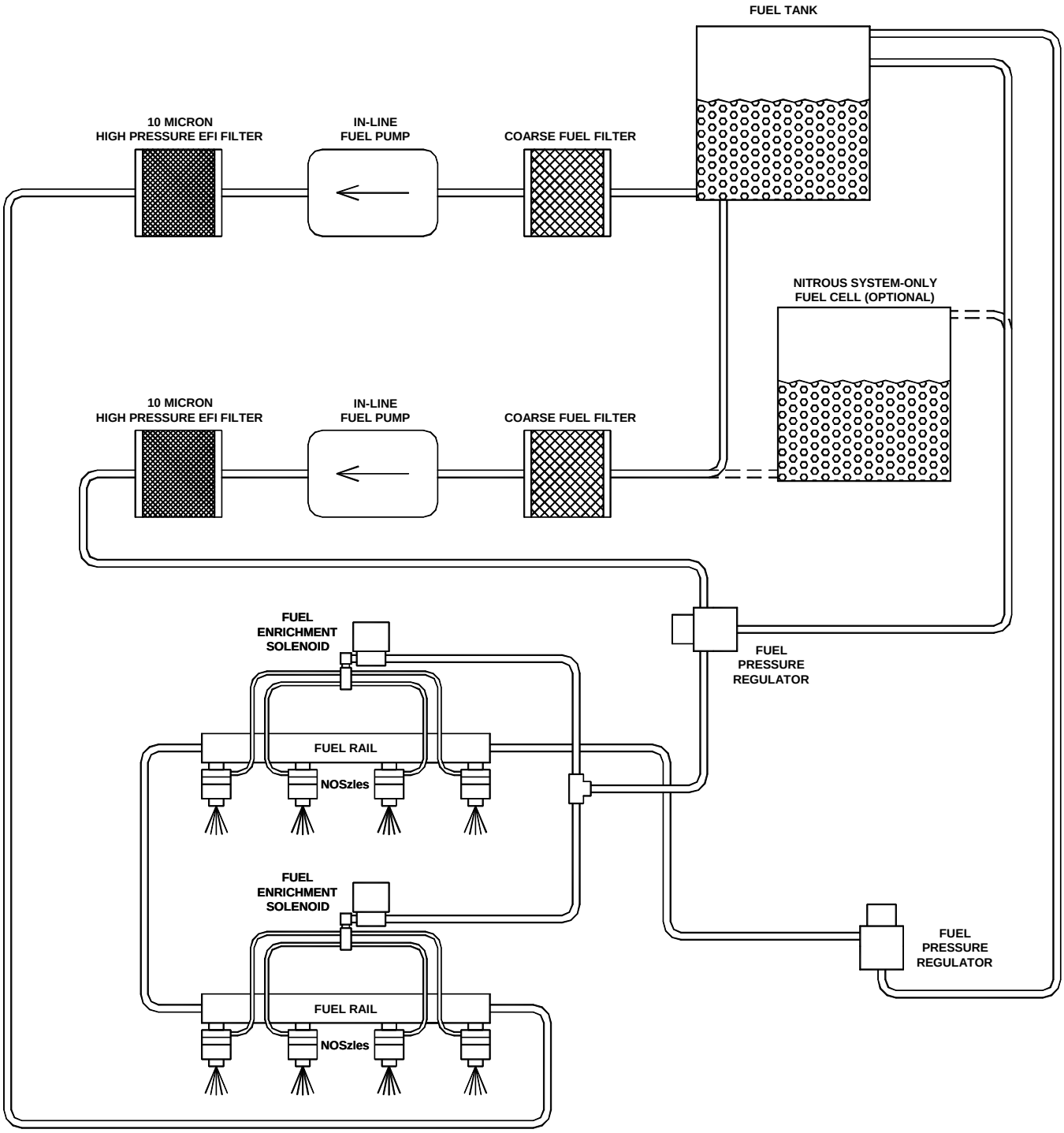


Figure 17 Independent Fuel Enrichment Diagram



3.7 Electrical System

Refer to Figure 19 and procedures in this section for electrical system installation.

WARNING! Death or injury may occur from working on a charged electrical system

1. Disconnect the car battery at the ground cable (if not already done).

WARNING! Binding or dragging of the throttle linkage will create a potentially dangerous stuck-throttle condition. Ensure that the microswitch does not interfere with normal throttle linkage operation.

2. Install the throttle microswitch as follows:

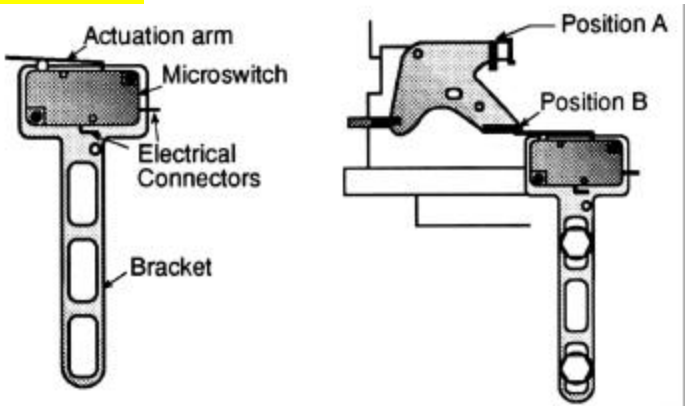
HINT: The microswitch may be mounted to the bracket in a variety of positions and on either side of the bracket. The bracket may be bent to suit the application.

A. Mount the throttle microswitch on the carburetor/intake manifold so that the throttle linkage movement triggers the microswitch.

B. Adjust the microswitch to trigger at wide-open throttle by adjusting the microswitch's position to ensure the actuation arm of the microswitch "clicks" at the same point your throttle linkage reaches wide-open throttle against the throttle stop (Position 18A).

C. Ensure that the microswitch is activated by the accelerator pedal: Have an assistant slowly press the pedal to the floor while you listen for the "click" of the microswitch (Position 18B).

Figure 18 Throttle Microswitch Installation

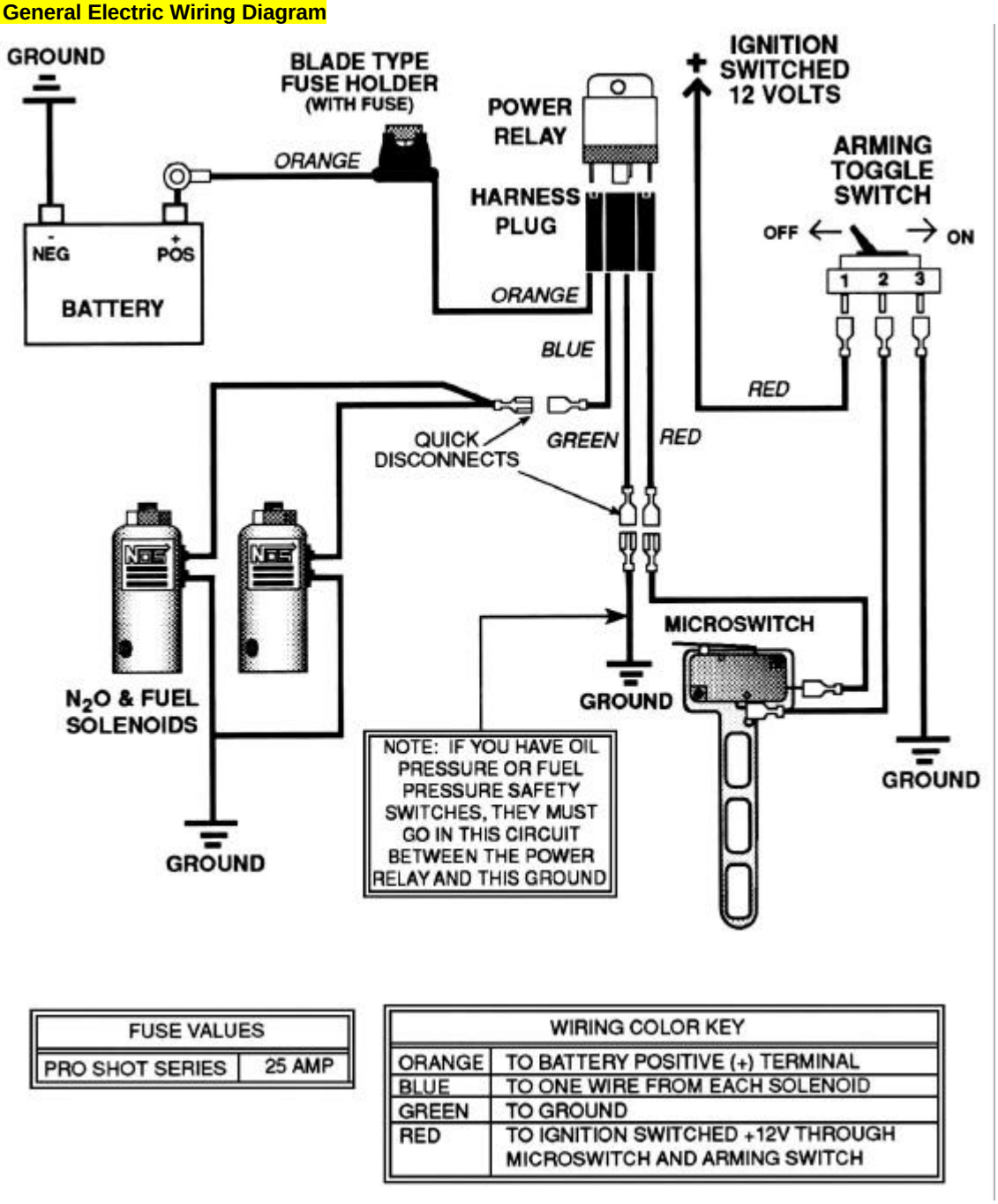


3. Install the NOS arming toggle switch in the vehicle interior, within easy reach of the driver.
4. Install the wiring relay in the engine compartment near the battery. The relay's orange wire should reach the battery (+) terminal.
5. Connect the orange relay wire to the battery (+) terminal.
6. Connect one wire from each solenoid together. Join the solenoid wires to the blue relay wire.
7. Connect the green relay wire to a good chassis ground.
8. Connect the red relay wire to either terminal on the microswitch.
9. Connect the other terminal on the microswitch to the middle (#2) terminal on the arming toggle switch.
10. Connect #1 terminal on the toggle arming switch to the switched +12 volt power source.
11. Connect #3 terminal of the arming switch to the ground.
12. Reconnect the battery.

CAUTION: Make certain the nitrous bottle is closed and the fuel pump is not running. Failure to comply will result in the intake manifold being filled with nitrous and/or fuel creating a potential engine explosion on start up.

13. Temporarily ground the open lead of the nitrous solenoid.
14. Turn ignition key to on position (don not start engine)
15. Turn the toggle arming switch on.
16. Hold the throttle wide open. You should hear a clicking noise if the nitrous is cycling correctly. If no noise is heard, check all the wiring connections and the wiring schematic.
17. Connect the remaining solenoid wire from each solenoid to the ground.

Figure 19 General Electric Wiring Diagram



FUSE VALUES	
PRO SHOT SERIES	25 AMP

WIRING COLOR KEY	
ORANGE	TO BATTERY POSITIVE (+) TERMINAL
BLUE	TO ONE WIRE FROM EACH SOLENOID
GREEN	TO GROUND
RED	TO IGNITION SWITCHED +12V THROUGH MICROSWITCH AND ARMING SWITCH

4.0 Alternate Sensor, Actuator, and Switch Components

1. In some racing applications, “pushbutton solenoid” activation is preferred. In such instances, the solenoid is connected to ground via a pushbutton momentary switch P/N 15601NOS. For information on wiring options, please call **NOS Technical Support at 1-714-546-0592.**

2. Almost all multi-point fuel injection systems are provided with throttle position sensors. NOS has throttle position sensor controllers that activate the solenoids, according to the sensor voltage output. This form of solenoid activation procedure is commonly referred as “TPS activation”. Such devices are more accurate than the microswitch. For P/Ns on TPS switches and information on wiring options, please call **NOS Technical Support at 1-714-546-0592.**

3. NOS offers fuel pressure safety switches. These switches only allow the nitrous and fuel solenoid to be activated, if a safe fuel pressure is existent in the enrichment fuel supply system. For information on pressure safety switches and information on wiring options, please call **NOS Technical Support at 1-714-546-0592.**

4. Activation of nitrous at low RPM levels can be detrimental to the engine performance and engine life. The RPM window activation switch only allows the nitrous and fuel solenoid to be activated if a safe RPM value has been reached. Some factory engine control units cut off the ignition if a maximum RPM level is reached. Although the engine is still at WOT and the solenoids are activated no nitrous and fuel is combusted. When the engine reaches safe RPM levels ignition is restored but excess fuel and nitrous are present in the manifold. Some applications may even cut the fuel injector to limit engine RPM. Because the engine is at WOT, the nitrous solenoid is still open thus generating an extreme lean condition. Under both conditions engine damage might occur. The RPM window activation switch cuts off the supply of fuel and nitrous until safe RPM levels are reached. The low and high RPM values can be trimmed according to the application. For information on pressure safety switches and wiring options, please call **NOS Technical Support at 1-714-546-0592.**

5.0 Baseline Tuning Suggestions

The NOSzle kit comes standard with 3 levels of jetting. They are calibrated to operate with 950 psi nitrous oxide bottle pressure and 43 psi of flowing fuel pressure.

Using these jetting combinations with lower bottle pressures and/or higher fuel pressure may produce an excessively rich condition. This can result in a loss of power, excessive exhaust smoke (black), or misfiring (backfiring through the exhaust). This condition may also arise if your fuel injection maps are calibrated too rich.

If you experience any of these conditions, or you desire to maximize the power output from your system, refer to Chapter 7, “Advanced Tuning Suggestions”.

CAUTION: Use of excessive bottle pressure and/or inadequate fuel pressure can result in an excessively lean condition. In extreme cases, this will produce catastrophic engine failure.

Table 5 Suggested Baseline Tuning Combinations

08008NOS Kit for 8 Cylinder Engine Applications

HP	N_2O Jetting at 950 psi	Fuel Jetting at 43psi	Fuel Octane Rating	Ignition Retard	Spark Plug Heat Range (Decrease)
100	18	10	92+ octane pump gas	2°-4°	Standard
175	24	16	105+ octane racing fuel	4°-6°	2-3 steps colder
300	32	18	110+ octane, 0.74 or higher SP racing fuel	10°-12°	3-4 steps colder

08006NOS Kit for 6 Cylinder Engine Applications

HP	N_2O Jetting at 950 psi	Fuel Jetting at 43psi	Fuel Octane Rating	Ignition Retard	Spark Plug Heat Range (Decrease)
100	22	14	92+ octane pump gas	2°-4°	Standard
150	26	16	105+ octane racing fuel	4°-6°	2-3 steps colder
175	28	17	110+ octane, 0.74 or higher SP racing fuel	10°-12°	3-4 steps colder

08004NOS Kit for 4 Cylinder Engine Applications

HP	N_2O Jetting at 950 psi	Fuel Jetting at 43psi	Fuel Octane Rating	Ignition Retard	Spark Plug Heat Range (Decrease)
75	22	14	92+ octane pump gas	2°-4°	Standard
125	26	16	105+ octane racing fuel	4°-6°	2-3 steps colder
150	28	17	110+ octane, 0.74 or higher SP racing fuel	10°-12°	3-4 steps colder

6.0 Preparing for Operation

After you have completed the installation of your NOSzle system kit, perform the following checkout procedure before operating your vehicle.

NOTE: Before performing steps 1-4, make sure that the nitrous bottle valve is closed and the main nitrous supply line is empty.

1. Turn on the ignition key for tapped-in fuel enrichment systems or turn-on the fuel pump for independent fuel enrichment system.

2. Check all the fuel lines and fittings for leaks.

3. Start the engine.

4. Close the nitrous bottle valve

5. Turn the arming toggle switch on. Set the engine speed at 2000 RPM. Briefly depress the activation arm on the microswitch. Engine speed should decrease if the fuel delivery system is performing properly; if not, refer to Appendix A, Troubleshooting Guide.

6. Open the nitrous bottle valve.

NOTE: There should be no change in the engine idle speed. If the idle speed changes, refer to Appendix A, Troubleshooting Guide.

7. Inspect the nitrous lines and fittings for leaks.

8. ENJOY!

7.0 Advanced Tuning for Maximum Power

After performing the Baseline Tuning Suggestion—Chapter 3, if you desire to maximize the performance of your system, perform the following:

NOTE: Always perform the nitrous/fuel ratio modifications listed in Section 7.1before attempting to optimize the ignition timing (Section 7.2). Improper nitrous/fuel ratio combinations can mislead you when attempting to optimize the ignition timing.

7.1 Determining Optimum Nitrous/Fuel Ratio

The jetting combinations included in your kit are compromises, intended to provide you with a safe starting point. They are intended to be used with 950psi nitrous bottle pressure and 43 psi flowing fuel pressure. In many instances, installing slightly smaller fuel jets than the units provided in your kit, will provide a more optimum nitrous/fuel ratio and increase power.

HINT: The use of a wide band O2 A/F ratio meter in addition of “reading the spark plugs” will help in achieving optimum and safe engine performance.

Always run the baseline jetting included in your kit before attempting to decrease fuel jet size. Optimum jetting can be determined using the following procedure.

1. Stabilize the nitrous bottle pressure at 950 psi.

2. Perform a dynamometer pull or a full throttle pass down the racetrack. Note the power reading or vehicle mph (not e.t.). Examine the spark plugs for an indication of lean or rich nitrous/fuel conditions (refer to Figure 20 for tips on reading the spark plugs).

CAUTION! Terminate test immediately if pinging, knocking, detonation appears during the test. If engine does not pull hard (expected HP or torque gains are not observed), terminate test and investigate before continuing.

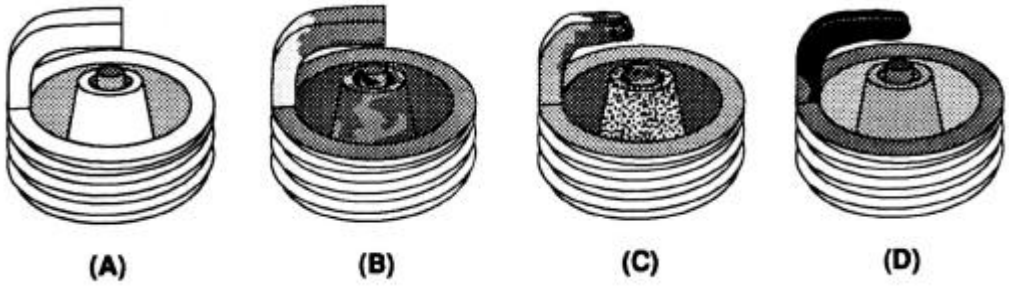
2A. If spark plugs appear to be excessively rich, decrease the fuel jet size 2 steps (ex. 16 to 14, 18 to 16, etc.).

2B. If spark plugs appear to be excessively lean, increase the fuel jet size 2 steps.

2C. If spark plugs have a “like new” appearance on the porcelain and electrode, do not make a fuel jetting change.

3. Repeat steps 1 and 2 until the desired mixture is obtained.

Figure 20 Spark Plug Condition



How to Read Spark Plugs from a Nitrous Oxide Injected Engine

A. Correct Timing, Mixture, and Spark Plug Heat Range
The ground strap retains a "like new" appearance. The edges are crisp, with no signs of discoloration. The porcelain retains a clear white appearance with no "peppering" or spotting.

B. Excessively Rich Mixture
The porcelain may be fuel stained, appearing brown or black. In extreme cases, the ground strap, electrode, and porcelain may be damp with gasoline, or smell of fuel.

C. Detonation
The edges of the ground strap may become rounded. The 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, inadequate fuel octane, or excessively lean mixture.

D. Excessively Lean Mixture
The edges of the 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.

7.2 Determining Optimum Ignition Timing

IMPORTANT! Ignition timing should be retarded approximately 2 degrees per 50 HP increase due to nitrous oxide injection. Start with the engine's best total timing and reduce from there. Use the initial settings, which are 2-3 degrees more retarded than you expect to be optimum.

Example:
Ignition Timing without Nitrous---------- 38°
100 HP Increase from Nitrous-------2°/50HP------- 4° Retard
Initial Safety Margin---------- 2° Retard
Initial Timing with Nitrous---------- 32°

The following procedure for determining ignition timing should allow you to determine the optimum setting for your vehicle, without incurring engine damage during the tuning phase.

1. Estimate the reduced ignition timing that you think will produce the best power, based upon the 2 degree retard per 50 horsepower increase rule.

2. Set the ignition timing 2 to 3 degrees retarded from your best power estimate setting.

3. Stabilize the nitrous bottle pressure at 950 psi.

4. Perform a dynamometer pull or a full throttle pass down the racetrack. Note the power reading or vehicle mph.

5. Increase the ignition timing 2 degrees.

6. Perform a dynamometer pull or a full throttle pass down the racetrack. Note the power reading or vehicle mph. Examine the spark plugs for signs of detonation (refer to Figure 20 for tips on reading spark plugs).

   6A. If power increase or vehicle mph increase **and** spark plugs show no sign of overheating or detonation, increase the ignition timing 2 degrees.

   6B. If power increase or vehicle mph increase **and** spark plugs begin to show slight signs of detonation—STOP. Do not advance the timing further. You may choose to reduce the timing 2 degrees at this point for an extra margin of safety.

   6C. If power decreases or vehicle mph decreases, reduce the ignition timing 2 degrees.

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

8.0 Routine Maintenance

8.1 Nitrous Solenoid Filter

When nitrous bottles are refilled, they can become contaminated with debris, if the refiller does not have an adequate filter in his transfer pump mechanism. Contaminants in the bottle will eventually become lodged in the nitrous solenoid filter fitting.

You should periodically (after every 20-30 pounds of nitrous usage) examine the mesh in the nitrous filter for debris.

To clean the filter, follow the following steps:

1. Close the valve on the nitrous bottle.
2. Empty the main nitrous feed line.
3. Disconnect the main nitrous feed line from the nitrous solenoid.
4. Remove the nitrous filter fitting from the nitrous solenoid.
5. Remove **all** Teflon paste debris from the solenoid inlet port threads and from the nitrous solenoid filter pipe threads.
6. Examine the mesh in the nitrous filter fitting for contaminants. Blow out debris with compressed air, if necessary.
7. Apply fresh Teflon paste to the nitrous filter pipe threads. Reinstall the filter in the nitrous solenoid.
8. Reconnect the main nitrous supply line to the nitrous solenoid.

8.2 Nitrous Solenoid Plunger

8.2.A General Information

The seals used in NOS nitrous solenoid plungers are constructed from materials which are designed to be used with nitrous oxide. When kept free from fuel contaminants or from overpressurization, they should provide trouble free performance.

You should periodically (after every 20-30 pounds of nitrous usage) examine the seal in the nitrous solenoid plunger.

Due to the NOSzle System being a wet style nitrous kit, the nitrous solenoid plunger could potentially be exposed to fuel vapors. Fluctuations in the intake manifold pressure due to opening and closing of the throttle and intake valves could induce flow into and out of the NOSzle system, when the NOS system is not in use. Long term exposure of the nitrous solenoid plunger seal to the fuel vapors will result in swelling of the plunger seal. This will reduce the nitrous flow (causing an excessively rich nitrous/fuel condition and a loss of power).

The seals used in NOS nitrous solenoid plungers are designed to work at pressures up to 1100 psi. Exposing the plunger to excessive pressure (whether the vehicle is sitting or in-use) can result in the seal in the plunger swelling or in extreme cases disintegrating.

NOTE: The seals are designed so that if they fail due to overpressurization, they will not leak, the valve will just fail to flow nitrous oxide.

Swelling of the nitrous solenoid plunger seal will reduce nitrous flow (causing an excessively rich nitrous/fuel condition and a loss of power).

8.2.B Nitrous Solenoid Plunger Disassembly and Inspection

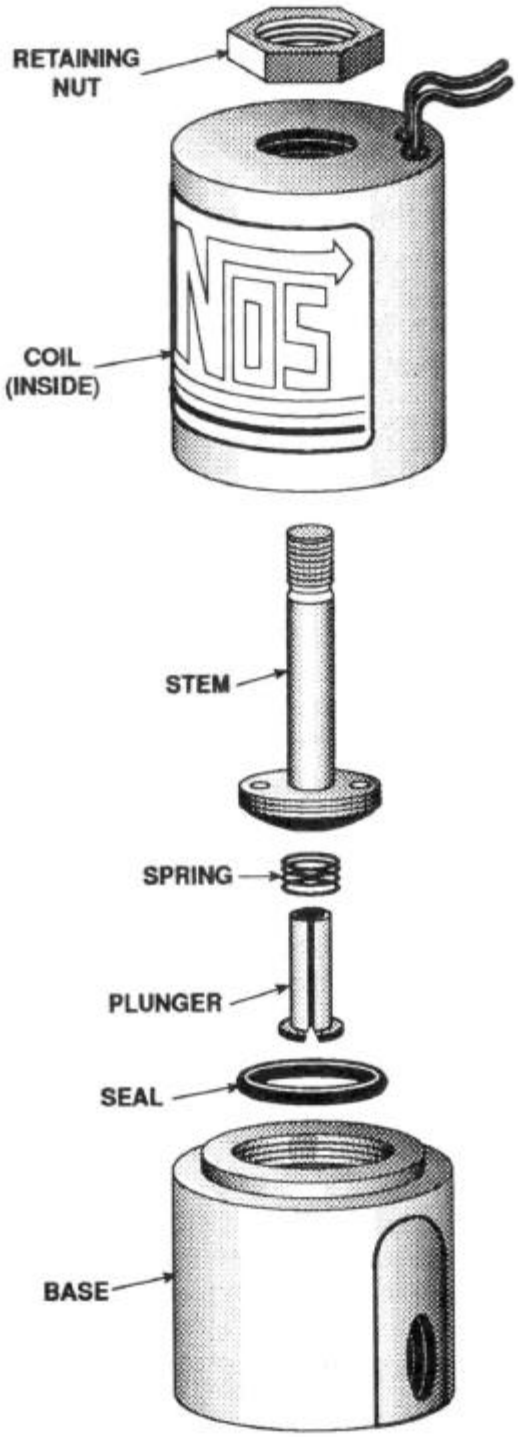
1. Close the valve on the nitrous bottle.
2. Empty the main nitrous supply line.
3. Remove the retaining nut from the nitrous solenoid.
4. Remove the coil and housing from the nitrous solenoid base.
5. Unscrew the stem from the nitrous solenoid base. Do this by double nutting the stem, or by using a solenoid stem removal tool (NOS P/N 16666-S). **Do not use pliers on the solenoid stem. Damage to the stem will result.**
6. Remove the stem, spring, and plunger from the solenoid base.

7. Examine the plunger seal for swelling. The seal surface should be flat, except for a small circular indentation in the center of the seal;

   A fuel-contaminated seal will protrude from the plunger and be dome-shaped. A fuel-contaminated seal may return to its original shape if left out in the fresh air for several days. It may then be returned to service.

   A seal, which has been overpressurized, may be dome-shaped, or the sealing surface may be flat with the seal protruding out of the plunger. A dome-shaped seal may return to its original shape if left out in the fresh air for several days. It may then be returned to service. A seal, which is flat, but protrudes from the plunger body has probably failed internally and should be replaced.

Figure 21 Exploded View of a Typical Solenoid



Appendix A Troubleshooting Guide

The troubleshooting chart on the following pages should help determine and rectify most problems with your installed NOS system. If you still need assistance determining or fixing problems, call NOS Technical Support Department at 1-714-546-0592 or fax at 1-714-545-8319.

PROBLEM	POSSIBLE CAUSES	DIAGNOSTIC PROCEDURE	CORRECTIVE ACTION
No change in engine speed when the fuel solenoid is activated (Preparing for Operation—Chapter 6).	System wired incorrectly.	Compare wiring to schematic.	Wire per instructions.
	Restricted fuel line.	Inspect fuel line for restrictions (crimped or plugged).	Remove restrictions.
	Malfunctioning fuel solenoid.	Turn arming switch ON. Activate microswitch. Solenoid should make "clicking" noise.	Repair/replace solenoid.
Change in engine speed when nitrous bottle valve is opened (Preparing for Operation—Chapter 6).	Malfunctioning nitrous solenoid.	Remove and inspect solenoid.	Repair/replace solenoid.
Engine runs rich when system is activated.	Bottle valve not fully opened.	Check bottle valve.	Open valve fully.
	Bottle mounted improperly.	Check bottle orientation.	Mount bottle properly.
	Plugged nitrous filter.	Inspect filter.	Clean/replace filter.
	Low bottle pressure.	Check bottle temperature.	Set bottle temperature to 80° to 85°F.
	Inadequate nitrous supply.	Weigh bottle.	Fill bottle.
	Mismatched N_2O/fuel jetting.	Compare jetting to recommended values.	Install correct jets.
	Excessive fuel pressure.	Install fuel pressure gauge, such as NOS P/N 15931, in the fuel line. Measure the pressure during acceleration, with the system activated.	Regulate pressure down, or install smaller fuel jetting.
	Loose nitrous solenoid wiring.	Inspect the solenoid wiring.	Repair wiring.
	Malfunctioning nitrous solenoid.	**WARNING:** *Solenoid discharges nitrous at a high rate. Don't inhale nitrous; death may occur. Skin contact may cause frostbite.* Close bottle valve. Disconnect the solenoid outlet port. Disconnect the solenoid (+) lead. Open the nitrous bottle valve. Briefly connect the +12V to the solenoid. Solenoid should discharge N_2O at a high rate.	Rebuild solenoid.
No change in performance when system is activated.	System wired incorrectly.	Compare nitrous wiring to schematic.	Wire system per instr.
	Loose ground wire(s).	Connect 12V test light to battery (+) terminal. Check for continuity at grounds noted in schematic.	Tighten/repair loose ground(s).
	Malfunctioning pushbutton.	Turn bottle valve off. Turn arming switch on. Connect 12V test light to battery (-). Turn pushbutton switch ON. Check for continuity at pushbutton output pole.	Replace pushbutton.
	No power to arming switch.	With vehicle ignition on, connect 12V test light to battery (-) terminal. Check for power at pole #1 on arming switch.	Repair wiring.
	Malfunctioning arming switch.	With vehicle ignition on, turn arming switch ON. Connect 12V test light to battery (-) terminal. Check for power at red wire on arming switch.	Replace arming switch.
	Malfunctioning throttle microswitch.	Temporarily disconnect power relay green wire from microswitch. Connect 12V test light to battery (+) terminal. Manually set microswitch ON. Check for continuity at microswitch positive terminal (see wiring schematic).	Replace throttle microswitch.
	Overly rich fuel condition.	Check for black smoke or backfiring through exhaust with system activated.	Install smaller fuel jet or decrease fuel pressure.

Engine detonates mildly when system is activated.	Excessive ignition timing.	Check ignition timing.	Reduce timing in 2° increments, up to 8° from non-nitrous conditions.
	Inadequate octane fuel.		Use higher octane fuel; up to 116VPC-16.
	Spark plug heat range too high.		Reduce spark plug heat range (maximum 2 steps).
	Too much nitrous flow.		Reduce nitrous jetting.
Engine detonates heavily when system is activated.	Inadequate fuel delivery due to: Plugged fuel filter.	Inspect fuel filter.	Clean or replace filter.
	Crimped fuel line.	Inspect fuel line.	Replace crimped line.
	Weak fuel pump.	Install fuel pressure gauge, such as NOS P/N 15931. Run engine under load at wide-open throttle, with system activated.	Repair/replace fuel pump.
High rpm misfire when system is activated.	Excessive spark plug gap.	Inspect spark plugs.	Set spark plug gap at 0.030” to 0.035”.
	Weak ignition/ignition component failure.	Inspect components (plug wires, distributor cap, etc.)	Replace worn components.
Surges under acceleration when system is activated.	Inadequate supply of nitrous.	Check bottle weight.	Replace with full bottle.
	Bottle mounted incorrectly.	Compare bottle position and orientation to instructions.	Mount or orient bottle correctly.

Nitrous Oxide Accessories

To maintain optimum system performance on cold days, a ***Bottle Heater (P/N 14164NOS)*** is a must.

To maximize the efficiency of the system, a ***Bottle Blanket (P/N 14165NOS)*** is also suggested.

#10 Bottle Heater P/N 14164 NOS

#10 Bottle Blanket P/N 14165NOS

Throttle/RPM-Activated Switch P/N 15879NOS

Remote Bottle Valve P/N 16058NOS

The ***Throttle/RPM-Activated Switch, P/N 15879NOS,*** allows hands-free nitrous operation and prevents nitrous from being injected at speeds above or below operator-set levels. Greatly reduces chance of accidental engine damage. ON/OFF levels adjust from 2000 to 9000 RPM.

The ***Remote Bottle Valve, P/N 16058NOS*** is the perfect convenience accessory—electronically turns nitrous bottle on and off with the flick of a switch—no more trips to the trunk. It is also great as a safety shut-off valve. It operates on 12V DC. The complete kit includes hardware and installation instructions.

The ***Nitrous Pressure Gauge, P/N 15910NOS (-4AN lines) or P/N 15912NOS (-6AN lines)*** [0-1500 PSIG] is designed to provide accurate (±2% of full scale) readings of fuel pressure in carbureted applications.

The ***Fuel Pressure Gauges, P/N 15906NOS***[0-120 PSIG] ***and P/N 15900*** [0-15 PSIG] are engineered to provide accurate (±2% of full scale) readings for high and low fuel pressure applications.

To order, contact your local dealer, or call NOS Technical Support at 1-714-546-0592.

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