



P/N A5054-1-SNOS

## Multiple-Carburetor Big Shot

Kit Number: 02111NOS

## Two-Stage Big Shot

Kit Numbers: 02401NOS & 02402NOS



### OWNER'S MANUAL

**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.

**NOTICE:** The NOS Big Shot system kit is not intended for use on hatchback type vehicles without the use of NOS part numbers 16160NOS (External Aluminum Blow-Down Tube) and 16169NOS (Racer Safety Pressure Relief Cap).

## **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**

**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 the 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.**

**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 1-866-464-6553.

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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 PTFE-based **paste** on pipe style fittings.
- ❑ Make sure your engine and related components (ignition, carburetor, 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 at wide-open throttle only and at engine speeds above 2500 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 PTFE Tape on any pipe threads. Pieces of PTFE 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.
- ❑ **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.

## Chapter 1 Introduction to your NOS Nitrous Oxide Kit

### 1.1 General Information

NOS Multiple-Carburetor Big Shot Systems (Kits 02111NOS) and Two-Stage Big Shot Systems (02401NOS & 02402NOS) are intended for use on modified domestic V-8 engines of at least 450 cubic inch displacement.

#### 1.1.1 Multiple-Carburetor Big Shot System

Four jetting kits are supplied with kits 02111NOS, to allow you to vary your engine's power output.

## 1.1.2 Two-Stage Big Shot System

NOS Two-Stage Big Shot System Kits 02401NOS & 02402NOS are designed to provide great flexibility in choosing power levels. The first stage is adjustable from 150 to 200+ HP.

The second stage is adjustable from 225 to 325+ HP. Your kit will consist of a 02101NOS or a 02102 Big shot kit plus a 0023NOS Two-Stage application kit.

The two stages are designed to work independently. The system's electrical design prevents the two stages from operating at the same time. Never attempt to operate both stages at the same time. Table 1 shows the various operating modes of the system.

**Table 1 Two-Stage Big Shot System Operating Modes**

Throttle Position	Push Button	Stage 1	Stage 2
Wide open	Off	Active	Inactive
Wide open	On	Inactive	Active
All other positions	On/Off	Inactive	Inactive

## 1.2 Big Shot 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 ensure proper performance and engine life, the following is an absolute must:**

**NOTE:** Most fuel pumps are rated at free-flowing conditions. At 5 psi, their flow rates may be greatly reduced.

### Adequate Fuel Pressure and Delivery

Most carburetors are designed to work at 5-10 psi. When designing your fuel system, plan on your pumps and lines flow at least 0.10 gallons of *gasoline* per hour per horsepower at 5 psi. For alcohol applications, double this number.

### Forged Pistons

Cast pistons are very prone to failure at elevated cylinder temperatures and pressures.

### Intake Manifold

Due to the high flow rates of nitrous oxide and fuel that are attained with this kit, it is suggested that an intake with an open plenum (single plane or tunnel ram) be used. Intake manifolds that feature individual orifices or split plenums (dual plane) should not be used with the Big Shot kit.

### Connecting Rods

Standard type forged connecting rods tend to buckle under the high compressive loads generated with large doses of nitrous oxide.

### Crankshaft

Stock type cast crankshafts may break. Stock type forgings can bend or twist in 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 type ignition systems are prone to producing misfires at high-RPM, high cylinder pressure conditions. A quality aftermarket racing ignition is suggested for all applications.

## 1.3 Kit Components

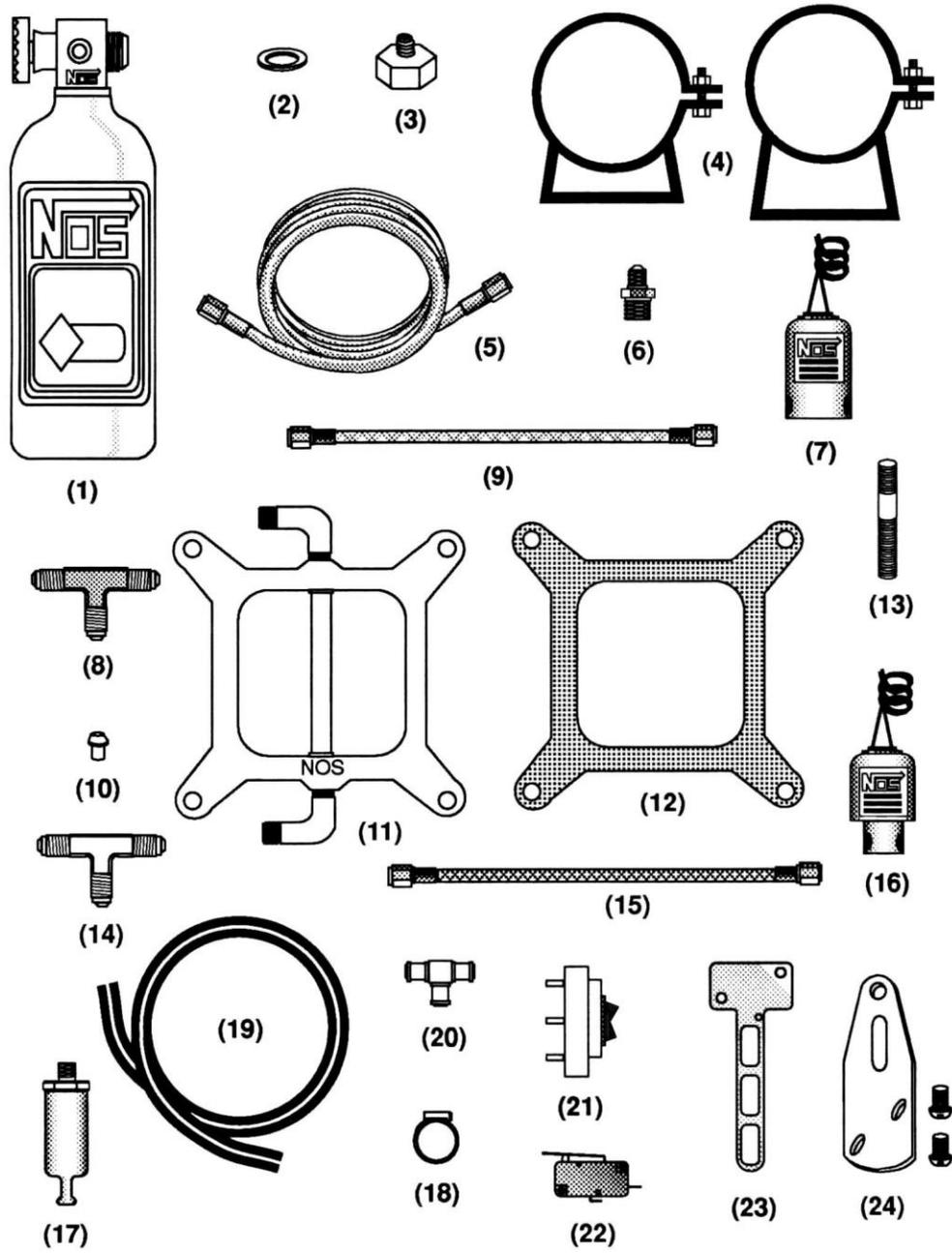
Before beginning the installation of your NOS kit, compare the components in your kit with those shown in Figure 1 or 2 and listed in Table 2 or 3. If any components are missing, please contact NOS Technical Support at 1-866-464-6553.

**Table 2 Multiple-Carburetor Big Shot Parts List (02111NOS)**

<b>Item</b>	<b>Description</b>	<b>Quantity</b>	<b>NOS P/N</b>
(1)	10 lb. Nitrous Bottle	1	14745NOS
(2)	Bottle Valve Washer	1	16210NOS
(3)	Bottle Valve Adapter	1	16230NOS
(4)	Bottle Bracket Set	1	14125NOS
(5)	Main N <sub>2</sub> O Feed Line 6AN—14 ft.	1	15475NOS
(6)	6AN Nitrous Filter (Blue)	1	15564NOS
(7)	Nitrous Solenoid	1	16045NOS
(8)	1/8" NPT x 4AN TEE (Blue)	1	17260NOS
(9)	4AN x 3AN Hose 18" (Blue)	2	15345NOS
(10)	Flare Jet Assortment	12	13760-XX-SNOS
(11)	Injector Plate with 90° Fittings	2	*
(12)	Carburetor Gaskets	4	*
(13)	Long Carburetor Studs	8	*
(14)	1/8" NPT x 4AN TEE (Red)	1	17261NOS
(15)	4AN x 3AN Hose 18" (Red)	2	15346NOS
(16)	Fuel Solenoid	1	16050NOS
(17)	Fuel Filter (In-line)	1	15540NOS
(18)	Fuel Hose Clamps	4	36R646A
(19)	3/8" x 2 ft. Fuel Hose	1	15000-SNOS
(20)	Brass Fuel Line TEE Fitting	1	15534NOS
(21)	Rocker Arming Switch	1	15602NOS
(22)	Throttle Microswitch	1	15640NOS
(23)	Throttle Microswitch Bracket	1	15645-SNOS
(24)	Solenoid Mounting Bracket w/ screws	2	16500NOS

\* Varies with application.

Figure 1 Multi-Carburetor Big Shot System Components

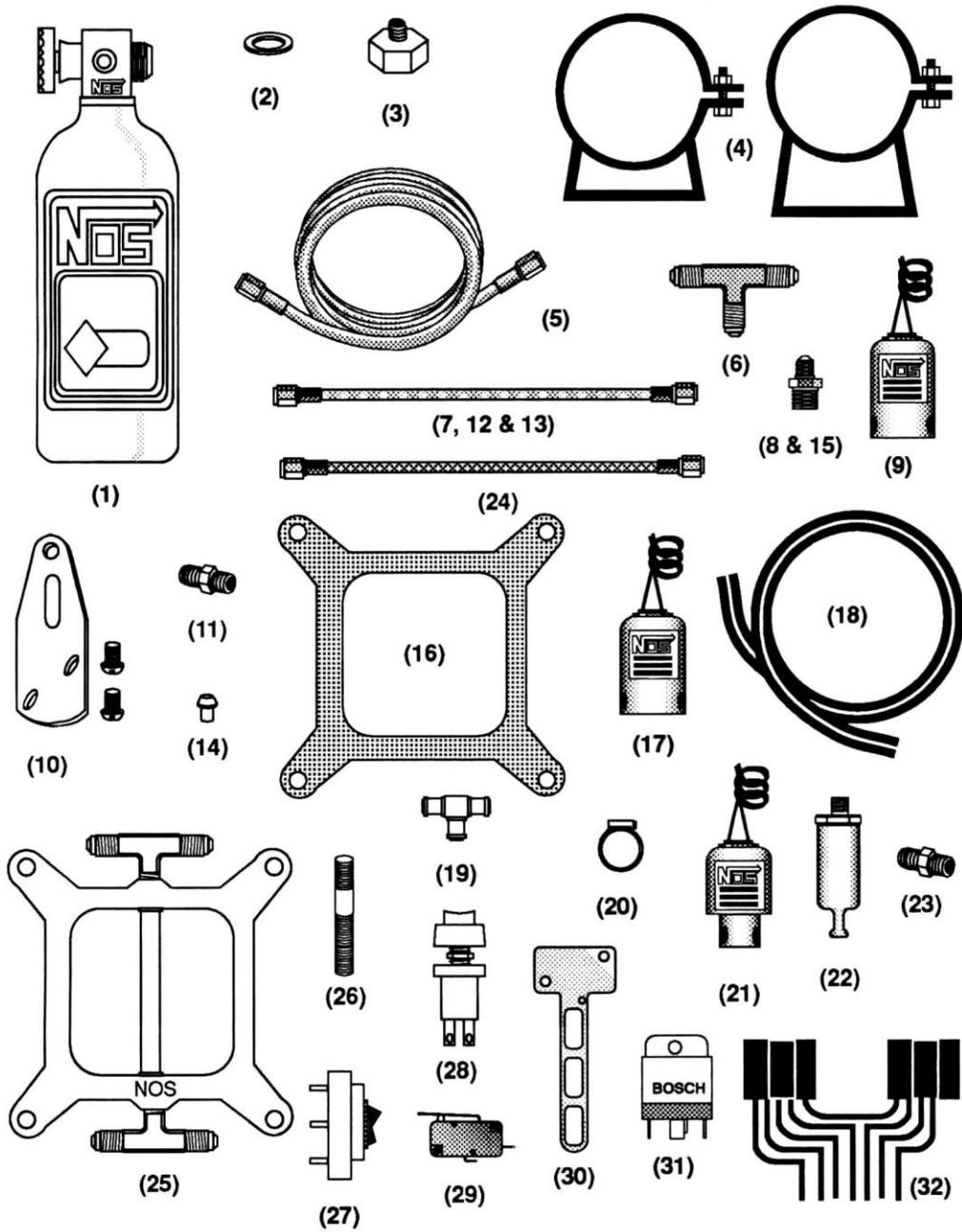


**Table 3 Two-Stage Big Shot Parts List (Kits 02401NOS & 02402NOS)**

<b>Item</b>	<b>Description</b>	<b>Quantity</b>	<b>NOS P/N</b>
(1)	10 lb. Nitrous Bottle	1	14745NOS
(2)	Bottle Valve Washer	1	16210NOS
(3)	Bottle Valve Adapter	1	16230NOS
(4)	Bottle Bracket Set	1	14125NOS
(5)	Main N <sub>2</sub> O Feed Line 6AN—14 ft.	1	15475NOS
(6)	6AN TEE Fitting (Blue)	1	17835NOS
(7)	6AN 1 ft. Hose (Blue)	1	15400NOS
(8)	6AN Nitrous Filter (Blue)	1	15564NOS
(9)	Second Stage N <sub>2</sub> O Solenoid (Pro Shot)	1	16045NOS
(10)	Solenoid Mounting Bracket w/ screws	4	16500NOS
(11)	1/8" NPT x 4AN Adapter Fitting (Blue)	2	17660NOS
(12)	4AN x 3AN Hose 1 ft. (Blue)	2	15340NOS
(13)	6AN x 4AN Hose 1 ft. (Blue)	1	15350NOS
(14)	Flare Jet Assortment		
(15)	4AN Nitrous Filter (Blue)	1	15560NOS
(16)	Carburetor Gaskets	*	*
(17)	First Stage Nitrous Cheater Solenoid	1	16000NOS
(18)	3/8" x 2 ft. Fuel Hose	2	15000-SNOS
(19)	Brass Fuel Line TEE Fitting	2	15534NOS
(20)	Fuel Hose Clamps	4	36R646A
(21)	Fuel Solenoid	2	16050NOS
(22)	Fuel Filter (In-line)	1	15540NOS
(23)	1/8" x 4AN Adapter Fitting (Red)	2	17961NOS
(24)	4AN x 3AN 1 ft. Hose (Red)	2	15341NOS
(25)	Injector Plate with TEE Fittings**	1	*
(26)	Long Carburetor Studs	4	*
(27)	Rocker Arming Switch	1	15602NOS
(28)	Activation Pushbutton	1	15610NOS
(29)	Throttle Microswitch	1	15640NOS
(30)	Throttle Microswitch Bracket	1	15645-SNOS
(31)	30 AMP Relay	2	15618NOS
(32)	Dual Relay Wiring	1	15605-SNOS

\* Varies with application. \*\*TEE fittings must be installed by kit installer.

Figure 2 Two-Stage Big Shot System Components



## Chapter 2 Kit Installation—Bottle Mounting for all Kits

### 2.1 Bottle Mounting Instructions

**NOTE:** Disconnect the battery ground before beginning installation.

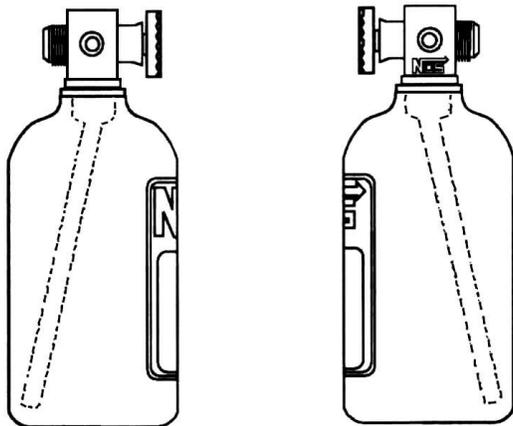
#### 2.1.1 Street Vehicles

Accurate calibration of your NOS 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. Additionally, if the bottle is mounted inside the passenger compartment, the safety blow-down valve must be vented externally from the cockpit. This procedure will prevent the passenger compartment from filling with a cloud of nitrous oxide if the safety pressure relief cap should happen to rupture.

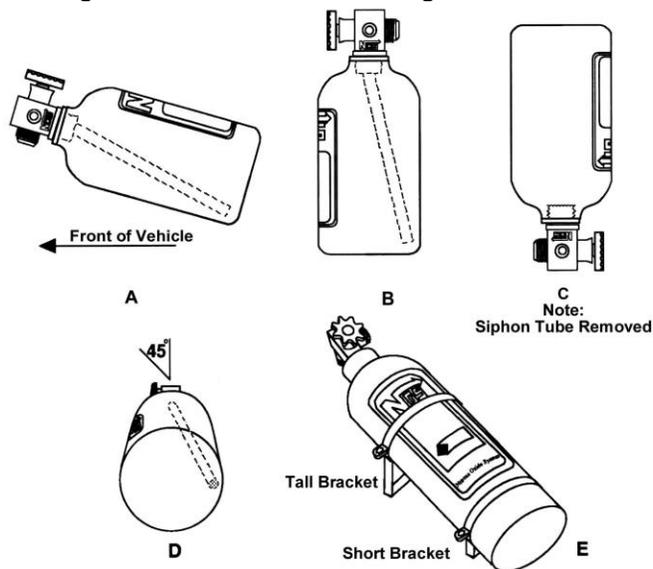
#### 2.1.2 Racing Vehicles

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.

**Figure 3 Nitrous Bottle Siphon Tube Orientation**



**Figure 4 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 3).

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 4A).

If the bottle is mounted vertically, the valve handle and label must face toward the front of the vehicle (Figure 4B). 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 4C). 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  $45^\circ$  toward the front of the vehicle (Figure 4D). 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 4E).

The most efficient mounting is the lay-down position (Figure 4A) 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.

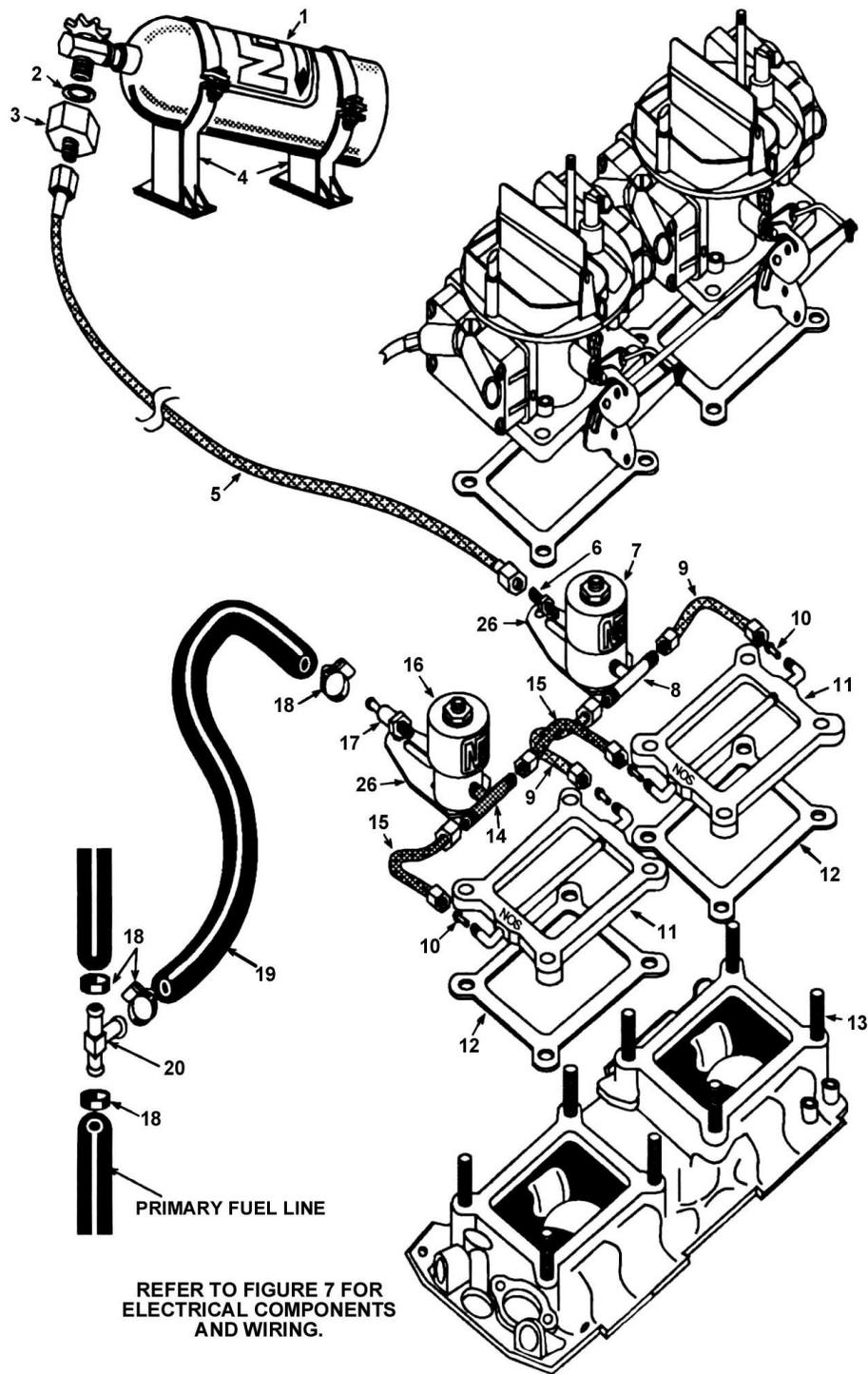
## 2.3 Bottle Installation

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

**NOTE:** Numbers in parentheses ( ) refer to the parts list/assembly drawing number for the component. Figure 5 shows the installation assembly for kits 02111NOS. Figure 8 shows the installation assembly for kits 02401NOS & 02402NOS.

1. Install the bottle nut adapter (3) and washer (2) on the nitrous bottle (1), and tighten securely.
2. Loosely install the bottle mounting brackets (4) 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 unit as a pattern to mark hole drilling. Drill four 5/16" holes in the mounting surface.
5. Mount the brackets securely to the surface (recommended minimum of 5/16" bolts or No. 12 sheet metal screws).
6. Tighten the bracket clamps on the bottle.

Figure 5 Multiple-Carburetor Big Shot System Assembly Drawing (Kits 02110NOS, 02110-9NOS, & 02111NOS)



### Chapter 3 Kit Installation—Multiple-Carburetor Big Shot System

**NOTE:** This chapter contains installation instructions for the Multi-Carburetor Big Shot Systems (Kits 02111NOS). If you are installing the Two-Stage Big Shot System (Kits 02401NOS & 02402NOS), skip to Chapter 4.

#### 3.1 Injector Plate Mounting

Use the following procedure to install the injector plate (11). Refer to Figure 5 for an illustration of part installation.

1. Remove the inlet ducting and air cleaners from the carburetors.

2. Disconnect the throttle linkage from the carburetors.
3. Disconnect the fuel line from the carburetors.
4. Remove the carburetors.
5. Remove the stock carburetor studs.
6. Install the extended carburetor studs (13).
7. Install the injector plates (11) and gaskets (12) on the intake manifold with the NOS label facing up.
8. Install the carburetors.
9. Connect the throttle linkage.
10. Repeat steps 1 through 9 for additional carburetors.

## 3.2 Solenoid Mounting

Use the following procedures to install the nitrous solenoid (7) and the fuel solenoid (16).

**CAUTION:** Do not overtighten the vise in the following procedure, or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

### 3.2.1 Nitrous Solenoid Installation

1. Clamp the nitrous solenoid base (7) in a bench vise.
2. Install the 6AN nitrous filter fitting (6) in the inlet port of the nitrous solenoid.
3. Install the blue 1/8" NPT x 4AN TEE (8) in the outlet port of the nitrous solenoid.
4. Attach the nitrous solenoid to the solenoid mounting bracket (26) and remove the solenoid assembly from the vise.
5. Connect the 18" blue 4AN x 3AN hose (9) to the TEE fitting in the outlet port of the solenoid and to the blue 90° fitting on the injector plate.
6. Repeat steps 5 and 6 for an additional injector plate.

### 3.2.2 Fuel Solenoid Installation

**CAUTION:** Do not overtighten the vise in the following procedure, or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

1. Clamp the fuel solenoid base (16) in a bench vise.
2. Install the fuel filter fitting (17) in the inlet port of the fuel solenoid.
3. Install the red 1/8" NPT x 4AN TEE (14) in the outlet port of the fuel solenoid.
4. Attach the fuel solenoid to the solenoid mounting bracket (24) and remove the solenoid assembly from the vise.
5. Install the proper fuel jet (10) in the red 90° fitting on the injector plate (see Section 6.1), with the beveled edge out.
6. Connect the 18" red 4AN x 3AN hose (15) to the TEE fitting in the outlet port of the solenoid and to the red 90° fitting on the injector plate.
7. Repeat steps 5 and 6 for an additional injector plate.

## 3.3 Nitrous Feed Line Installation

**HINT:** Most late-model vehicles have access plugs in the trunk floor, which are convenient for line routing. Following the fuel lines along the underbody, and entering the engine bay through the front fender well between the plastic inner fender and the body, usually works well.

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 (5) along the proposed route.
3. If it is necessary to support the nitrous supply line under the vehicle, use 1/2" Tinnerman clamps or nylon tie-wraps to support the line securely.
4. Attach the nitrous supply line to the nitrous bottle valve adapter (3).

**WARNING: Nitrous oxide is dangerous to humans if inhaled or comes in contact with the skin. Always point the nitrous line opening away from people when purging the line.**

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.
6. Attach the nitrous supply line to the nitrous filter fitting (6) on the solenoid (7) inlet port.

### 3.4 Auxiliary Fuel Line Installation

Under most operating conditions, it is suggested that a separate 3/8" fuel line and pump be dedicated to the nitrous system. If you choose to use a single-line fuel system to feed both the engine and the nitrous system, follow these instructions, but remember—at higher power levels, this fuel system may be inadequate.

To install the supplied auxiliary fuel line (19):

1. Choose the location where the primary fuel line is to be tapped.
2. Cut and deburr the primary fuel line.
3. Install the brass fuel line TEE fitting (20) in the primary fuel line and secure both sides with hose clamps (18).
4. Connect one end of the auxiliary fuel line (19) to the base of the brass TEE fitting (20) with a hose clamp (18).
5. Connect the open end of the auxiliary fuel line to the fuel filter (17) in the inlet port of the fuel solenoid (16) with a hose clamp (18).

### 3.5 Electrical System

Refer to the wiring schematic (Figure 6) for the 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).

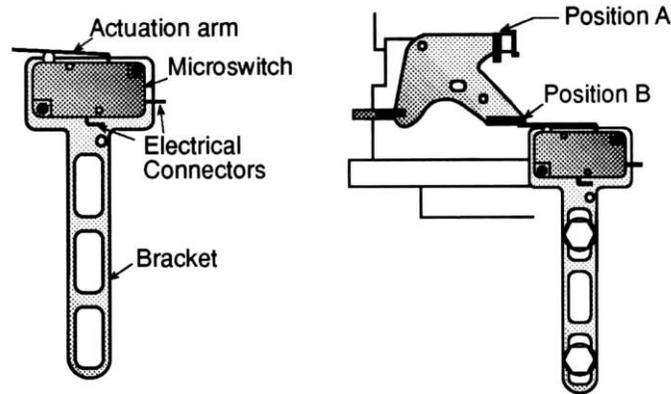
**WARNING! Binding or dragging of the throttle linkage will create a potentially dangerous stuck-throttle condition. Ensure that the microswitch does not interfere with normal throttle linkage operation.**

2. Install the throttle microswitch (22) as follows:

**HINT:** The microswitch may be mounted to the bracket (23) in a variety of positions and on either side of the bracket. The bracket may be bent to suit the application.

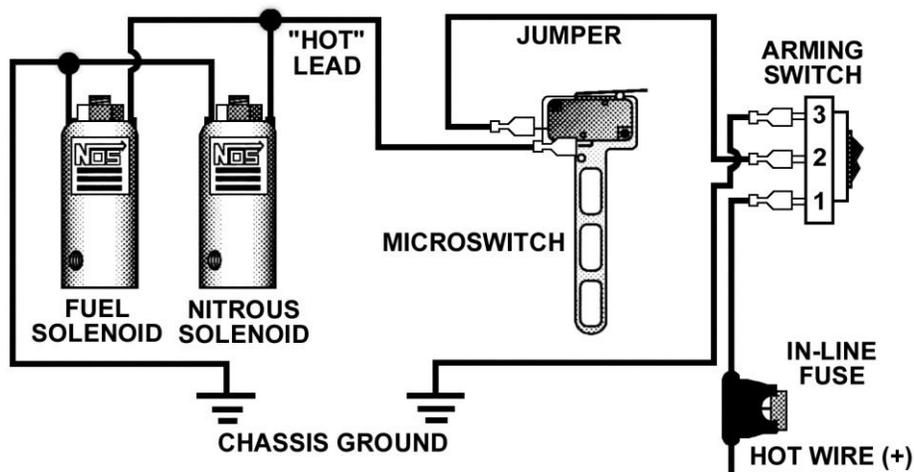
- A. Mount the throttle microswitch on the carburetor so that the throttle linkage movement triggers the microswitch.
- B. Adjust the microswitch to trigger at wide-open throttle by adjusting the microswitch's position to ensure the actuation arm of the microswitch "clicks" at the same point your throttle linkage reaches wide-open throttle against the throttle stop (Position 6A).
- 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 6B).

**Figure 6 Throttle Microswitch Installation**



3. Install the NOS arming switch in the vehicle interior, within easy reach of the driver.
  4. Connect terminal #1 on the arming switch to an ignition switched +12V source, using the fused red wire provided.
- NOTE:** When selecting an ignition switched +12V source, ensure that your source is capable of handling the amperage of the fuse provided by NOS.
5. Connect terminal #2 of the arming switch to one post of the throttle microswitch (either post will do), with the blue wire provided.
  6. Connect terminal #3 of the arming switch to a ground. (You may elect to skip this step. If you do so, the light on the arming switch will not illuminate when the system is armed.)
  7. Connect the open post of the microswitch to one wire from each solenoid (either wire will do—the solenoids are not polarized), using the blue wire provided.
  8. Connect the open wire from each solenoid to a ground.

**Figure 7 Multiple-Carburetor System Big Shot System Wiring Diagram (Kits 02110NOS, 02110-9NOS, & 02111NOS)**



## Chapter 4 Kit Installation—Two-Stage Big Shot System

**NOTE:** This chapter contains installation instructions for the Two-Stage Big Shot System (Kits 02401NOS & 02402NOS). If you are installing the Multi-Carburetor Big Shot System (Kits 02111NOS), go back to Chapter 3.

### 4.1 Injector Plate Mounting

1. Remove the carburetor inlet ducting and air cleaner.
2. Disconnect the throttle linkage from the carburetor.



## 4.2 Solenoid Mounting

### 4.2.1 Nitrous Solenoid Installation (First Stage)

**CAUTION:** Do not overtighten the vise in the following procedure or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

**NOTE:** Solenoids can be mounted onto carburetor studs or attached to the manifold. Solenoid mounting brackets may be bent if necessary, to facilitate mounting and connection.

1. Clamp the first stage nitrous solenoid base (17) in a bench vise.
2. Install the 4AN nitrous filter fitting (15) into the inlet port of the nitrous solenoid.
3. Install the blue 1/8" NPT x 4AN fitting adapter (11) in the outlet port of the nitrous solenoid.
4. Remove the nitrous solenoid assembly from the vise.
5. Install the proper jet (14) in the blue TEE fitting on the injector plate (25), see Section 6.2, with the beveled edge out.
6. Connect the 1 ft. blue 4AN x 3AN hose (12) to the outlet port of the solenoid and to the blue TEE fitting on the injector plate.
7. Tighten the solenoid and mount firmly in place.

### 4.2.2 Fuel Solenoid Installation (First Stage)

**CAUTION:** Do not overtighten the vise in the following procedure or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

**NOTE:** Solenoids can be mounted onto carburetor studs or attached to the manifold. Solenoid mounting brackets may be bent, if necessary, to facilitate mounting and connection.

**NOTE:** The first and second stage fuel solenoids have identical part numbers. The fuel solenoid that is installed on the same side of the manifold as the first stage nitrous solenoid is identified as the designated first stage fuel solenoid. The other identical fuel solenoid, installed on the opposite side of the manifold—on the same side as the second stage nitrous solenoid—is identified as the designated second stage fuel solenoid. The system's electrical design will enable these two solenoids to function as the first and second stage fuel solenoids.

1. Clamp the designated first stage fuel solenoid base (21) in a bench vise.
2. Install the fuel filter fitting (22) in the inlet port of the fuel solenoid.
3. Install the red 1/8" NPT x 4AN adapter fitting (23) in the outlet port of the fuel solenoid.
4. Remove the fuel solenoid assembly from the vise.
5. Install the proper fuel jet (14) in the red TEE fitting on the injector plate (25), see Section 6.2, with the beveled edge out.
6. Connect the 1 ft. red 4AN x 3AN hose (24) to the outlet port of the solenoid and to the red TEE fitting on the injector plate.
7. Install the solenoid on the same side of the manifold as the first stage nitrous solenoid. Tighten the solenoid and mount firmly in place.

### 4.2.3 Nitrous Solenoid Installation (Second Stage)

**CAUTION:** Do not overtighten the vise in the following procedure or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

**NOTE:** Solenoids can be mounted onto carburetor studs or attached to the manifold. Solenoid mounting brackets may be bent, if necessary, to facilitate mounting and connection.

1. Clamp the second stage nitrous solenoid base (9) in a bench vise.
2. Install the 6AN nitrous filter fitting (8) into the inlet port of the nitrous solenoid.
3. Install the blue 1/8" NPT x 4AN adapter fitting (8) in the outlet port of the nitrous solenoid.

4. Remove the nitrous solenoid assembly from the vise.
5. Install the proper fuel jet (14) in the red TEE fitting on the injector plate (25), see Section 6.2, with the beveled edge out.
6. Connect the 1ft. red 4AN x 3AN hose (24) to the outlet port of the solenoid and to the red TEE fitting on the injector plate.
7. Install the solenoid on the same side of the manifold as the second stage nitrous solenoid. Tighten the solenoid and mount firmly in place.

#### 4.2.4 Fuel Solenoid Installation (Second Stage)

**CAUTION:** Do not overtighten the vise in the following procedure or the solenoid will be damaged.

**NOTE:** Remember to use PTFE paste *only* on pipe threads.

**NOTE:** Solenoids can be mounted onto carburetor studs or attached to the manifold. Solenoid mounting brackets may be bent, if necessary, to facilitate mounting and connection.

1. Clamp the designated second stage fuel solenoid base (21) in a bench vise.
2. Install the fuel filter fitting (22) in the inlet port of the fuel solenoid.
3. Install the red 1/8" NPT x 4AN adapter fitting (23) in the outlet port of the fuel solenoid.
4. Remove the fuel solenoid assembly from the vise.
5. Install the proper fuel jet (14) in the red TEE fitting on the injector plate (25), see Section 6.2, with the beveled edge out.
6. Connect the 1ft. red 4AN x 3AN hose (24) to the outlet port of the solenoid and to the red TEE fitting on the injector plate.
7. Install the solenoid on the same side of the manifold as the first stage nitrous solenoid. Tighten the solenoid and mount firmly in place.

#### 4.3 Nitrous Feed Line Mounting

**HINT:** Most late-model vehicles have access plugs in the trunk floor, which are convenient for line routing. Following the fuel lines along the underbody, and entering the engine bay through the front fender well between the plastic inner fender and the body, usually works well.

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 (5) along the proposed route.
3. If it is necessary to support the nitrous supply line under the vehicle, use 1/2" Tinnerman clamps or nylon tie-wraps to support the line securely.
4. Attach the nitrous supply line to the nitrous bottle valve adapter (3).

**WARNING:** Nitrous oxide is dangerous to humans if inhaled or comes in contact with the skin. Always point the nitrous line opening away from people when purging the line.

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.
6. Attach the nitrous supply line to the nitrous filter fitting (6) on the solenoid (7) inlet port.
7. Connect one end of the blue 6AN 1 ft. hose (7) to the open port of the 6AN TEE fitting.
8. Connect the open end of the 6AN 1 ft. hose to the 6AN nitrous filter fitting (8) on the inlet port of the second stage nitrous solenoid (9).
9. Connect one end of the blue 6 AN x 4AN 1 ft. hose (13) to the open port of the 6AN TEE fitting.

10. Connect the open end of the 6AN x 4AN 1 ft. hose to the 4AN nitrous filter in the inlet port of the first stage nitrous solenoid (17).
11. Ensure that all connections are snug.

#### 4.4 Auxiliary Fuel Line Installation

Under most operating conditions, it is suggested that a separate 3/8" fuel line and pump be dedicated to the nitrous system. If you choose to use a single-line fuel system to feed both the engine and the nitrous system, follow these instructions, but remember—at higher power levels, this fuel system may be inadequate.

To install the supplied auxiliary fuel line (18):

1. Choose the location where the primary fuel line is to be tapped.
2. Cut and deburr the primary fuel line.
3. Install the brass fuel line TEE fitting (19) in the primary fuel line and secure both sides with hose clamps (20).
4. Connect one end of the 2 ft. fuel line (18) to the base of the first brass fuel line TEE fitting with hose clamps (20).
5. Connect the open end of the 2 ft. fuel line to the base of the second brass fuel line TEE fitting (19) with a hose clamp.
6. Connect one end of each 3/8" fuel line to the open ports of the second fuel line TEE fitting with hose clamps.
7. Connect the open end of one 3/8" fuel line to the fuel filter on the inlet port of the designated first-stage fuel solenoid (21) with a hose clamp.
8. Connect the open end of the remaining 3/8" fuel line to the fuel filter on the inlet port of the designated second-stage fuel solenoid (21) with a hose clamp.

#### 4.5 Electrical System Installation

Refer to Figures 9 and 10 and the procedures in this section for the electrical system installation.

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

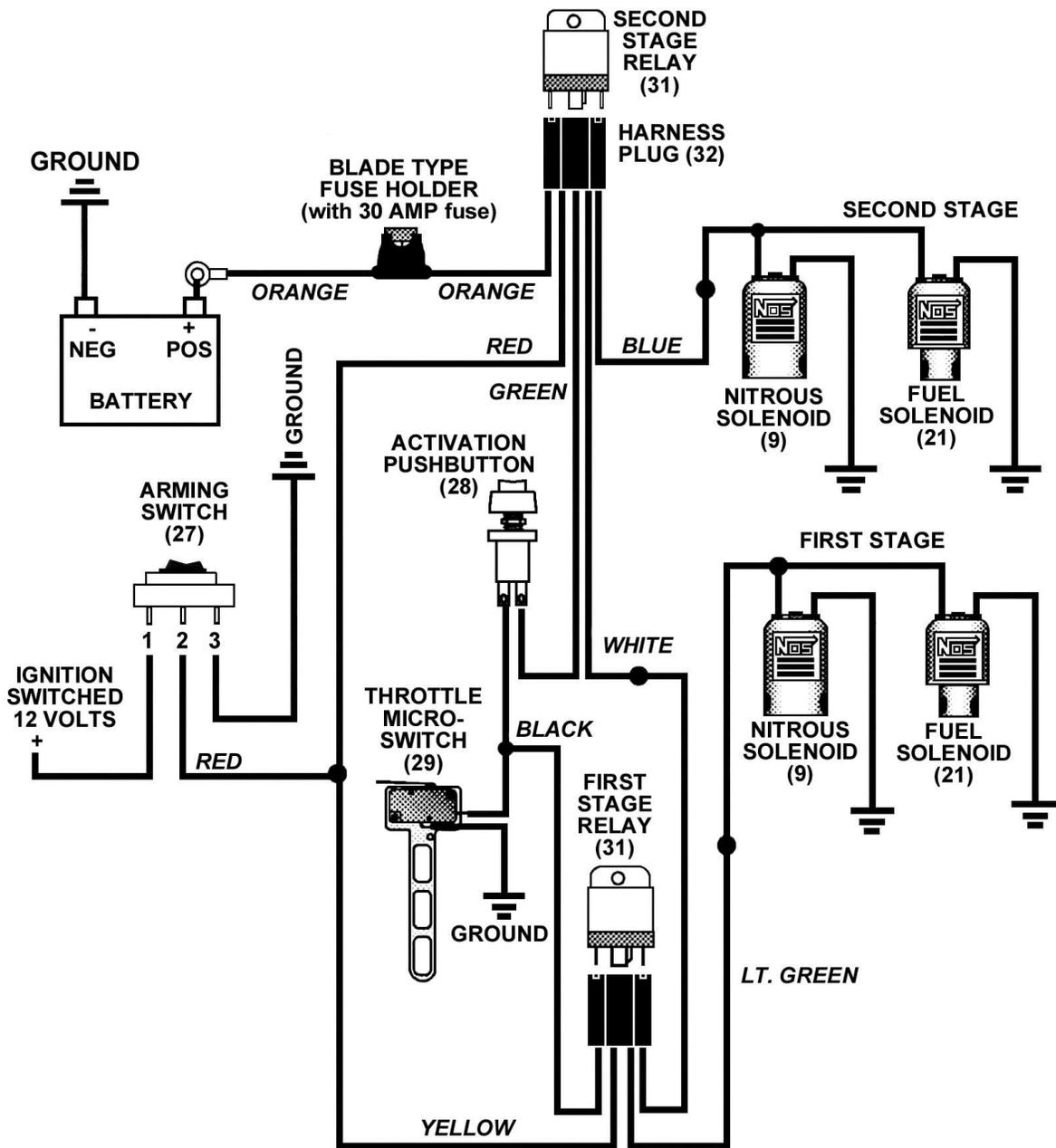
1. Disconnect the car battery at the ground cable (if not already done).
2. Install the activation pushbutton (19) in the vehicle's interior within easy reach of the driver.
3. Install the wiring relay (31) with the orange wire connected to the in-line fuse assembly, close enough to the battery to be easily connected.
4. Install the second relay (31) near the first relay.
5. Connect one wire from each solenoid to the ground.
6. Connect the light green wire from the second relay to the open wire from the first stage nitrous solenoid (9) and the designated second stage fuel solenoid (21).
7. Connect the blue wire from the first relay to the remaining wire on the second stage nitrous solenoid (9) and the designated second stage fuel solenoid (21).
8. Install the arming switch (27) within easy reach of the driver.
9. Connect the red wire from the first relay and the yellow wire from the second relay to the arming switch #2 (center) terminal.
10. Connect the arming switch #1 terminal to an ignition-switched +12V source.
11. Connect the arming switch #3 terminal to the ground.

**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.**

12. Install the throttle microswitch (29) where it will be triggered by the throttle linkage at wide open throttle, as follows:

Figure 9 Two-Stage Big Shot System Wiring Diagram (Kits 02401NOS & 02402NOS)

NOTE: Numbers in parentheses ( ) refer to the parts list/assembly drawing number for the component. See Table 3 & Figure 8.



**HINT:** The microswitch may be mounted to the bracket (30) in a variety of positions and on either side of the bracket. The bracket may be bent to suit the application.

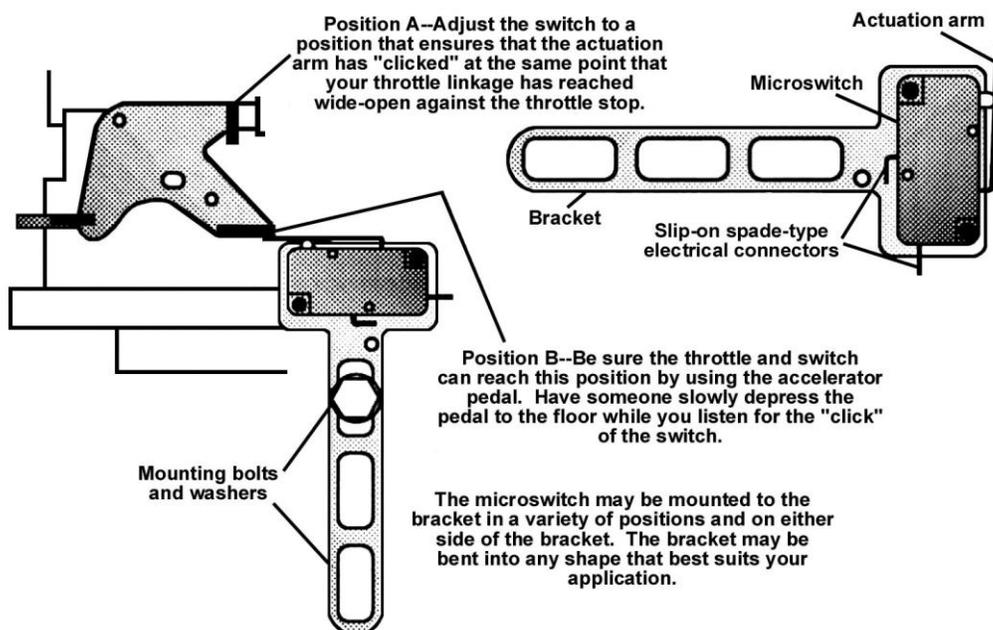
- A. Mount the throttle microswitch on the intake manifold, so that the throttle linkage movement triggers the microswitch.
- B. Adjust the microswitch to trigger at wide-open throttle by adjusting the microswitch's position to ensure the actuation arm of the microswitch "clicks" at the same point your throttle linkage reaches wide-open throttle against the throttle stop (Position 10A).
- C. Ensure that the throttle and switch can reach the activation position, as shown in Figure 10B by using the accelerator pedal. Have an assistant slowly press the pedal to the floor while you listen for the "click" of the microswitch.

13. Connect either terminal on the throttle microswitch to the ground.

14. Install the activation pushbutton (28) in a convenient position for the driver.
15. Connect the green wire from the first relay to either terminal on the activation pushbutton.
16. Connect the remaining activation pushbutton terminal and the black wire from the second relay to the open terminal on the throttle microswitch.
17. Connect the open lead from the in-line fuse assembly to the battery positive (+) terminal.
18. Reconnect the battery.

**HINT:** If the arming switch has been connected to a +12V ignition-switched source, nothing will work if the key is off, regardless of the arming switch position. Neither system can operate if the arming switch is off.

**Figure 10 Throttle Microswitch Installation**



## 4.6 Electrical System Checkout

1. Ensure that the nitrous bottle valve is closed and the fuel pump(s) are off.
2. Turn the arming switch on.
3. Press and hold the throttle full open. The first stage solenoids should click.
4. Push the activation pushbutton. The second stage solenoids should click.
5. Release the activation pushbutton. The first stage solenoid should click again.
6. Release the throttle.

## Chapter 5 Preparing for Operation

### 5.1 Checkout Procedure—Multiple-Carburetor Big Shot System

After you have completed the installation of your NOS Multiple-Carburetor Big Shot 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 fuel pump.
2. Check all the fuel lines and fittings for leaks.

3. Start the engine.
4. Turn the arming switch on.
5. With the N<sub>2</sub>O bottle valve closed and the N<sub>2</sub>O main feed line empty, depress the lever on the throttle microswitch. Briefly push the N<sub>2</sub>O activation pushbutton. The engine speed should decrease if the fuel delivery system is performing properly. If it is 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!

## 5.2 Checkout Procedure—Two-Stage Big Shot System

After you have completed the installation of your NOS Multiple-Carburetor Big Shot 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 fuel pump.
2. Check all the fuel lines and fittings for leaks.
3. Start the engine.
4. Turn the arming switch on.
5. First Stage check: With the N<sub>2</sub>O bottle valve closed and the N<sub>2</sub>O main feed line empty:
  - A. Set the engine speed at 2000 rpm.
  - B. Have an assistant briefly activate (press and release) the microswitch.
  - C. The engine speed should decrease, if the fuel delivery system is performing properly.
  - D. If the engine speed does not decrease, refer to Appendix A, Troubleshooting Guide.
6. Second Stage check: With the N<sub>2</sub>O bottle valve closed and the N<sub>2</sub>O main feed line empty:
  - A. Disconnect the light green wire from the designated first stage fuel solenoid.
  - B. Set the engine speed at 2000 rpm.
  - C. **At the same time**, have an assistant briefly activate (press and release) the microswitch **and** briefly activate the pushbutton.
  - D. The engine speed should decrease, if the fuel delivery system is performing properly.
  - E. If the engine speed does not decrease, refer to Appendix A, Troubleshooting Guide.
  - F. Connect the light green wire to the designated first stage fuel solenoid.
7. 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.

8. Inspect the nitrous lines and fittings for leaks.
9. ENJOY!

## Chapter 6 Tuning Suggestions

### 6.1 Tuning Suggestions—Multiple-Carburetor Big Shot System

Your NOS Multiple-Carburetor Big Shot System kit comes with four sets of nitrous and fuel jets, (Stage I, II, III, & IV). For maximum performance, the following tuning tips are suggested. Table 4 lists some suggested tuning combinations.

**NOTE:** Your combination may vary. These guidelines are suggested as a safe starting point in tuning. When using a multiple carb or 2-stage system, add the 2 HP figures together to determine correct timing and plugs as outline in section 6.3.1.

**Table 4 Suggested Baseline Tuning Combinations for NOS Multiple-Carburetor Big Shot Systems**  
**NOTE: All jetting is recommended based on 6 PSI fuel pressure and 950 PSI bottle pressure.**

### Multi-Carb Big Shot System

EXTRA HP	JETTING N <sub>2</sub> O/FUEL	FUEL OCTANE (R+M/2)	IGNITION TIMING	NGK OR EQUIVALENT SPARK PLUG
200 HP	.052/.049	110+ OCTANE RACING FUEL	*	-9
225 HP	.059/.055	110+ OCTANE RACING FUEL	*	-9
250 HP	.065/.061	112+ OCTANE RACING FUEL	*	-10
300 HP	.073/.067	114+ OCTANE RACING FUEL	*	-10
325 HP	.085/.073	114+ OCTANE RACING FUEL	*	-10
350 HP	.093/.085	114+ OCTANE RACING FUEL	*	-11

\* See section 6.3.1 for timing recommendations

At the 350+ level, the Big Shot nitrous solenoid is flowing near maximum capability. Increasing the jetting above these levels may result in some slight performance increase. If you need performance greater than 350+ delivers, contact the NOS Technical Support line.

## 6.2 Tuning Suggestions—Two-Stage Big Shot Systems

### 2-Stage Big Shot System, Stage 1

EXTRA HP	JETTING N <sub>2</sub> O/FUEL	FUEL OCTANE (R+M/2)	IGNITION TIMING	NGK OR EQUIVALENT SPARK PLUG
100 HP	.047/.047	93+ OCTANE FUEL	*	-7
125 HP	.055/.051	100+ OCTANE RACE FUEL	*	-8
150 HP	.063/.059	100+ OCTANE RACE FUEL	*	-9
185 HP	.073/.067	110+ OCTANE RACE FUEL	*	-9
210+ HP	.082/.076	110+ OCTANE RACE FUEL	*	-10
250+ HP	.093/.085	112+ OCTANE RACE FUEL	*	-10

\* See section 6.3.1 for timing recommendations

### 2-Stage Big Shot System, Stage 2

EXTRA HP	JETTING N <sub>2</sub> O/FUEL	FUEL OCTANE (R+M/2)	IGNITION TIMING	NGK OR EQUIVALENT SPARK PLUG
175 HP	.073/.067	110+ OCTANE RACE FUEL	*	-9
200 HP	.082/.076	110+ OCTANE RACE FUEL	*	-10
250 HP	.095/..085	112+ OCTANE RACE FUEL	*	-10
275 HP	.102/.095	114+ OCTANE RACE FUEL	*	-11

\* See section 6.3.1 for timing recommendations

Your NOS Two-Stage Big Shot System kit comes with four sets of jets for the First Stage and four sets for the Second Stage. For maximum performance, the following tuning tips are provided. Table 5 lists suggested tuning combinations for the First Stage. Table 6 lists suggested tuning combinations for the Second Stage.

**NOTE:** Your combination may vary. These guidelines are suggested as a safe starting point in tuning.

At the Stage IV level, the Cheater nitrous solenoid is flowing near maximum capability. Increasing the jetting above these levels may result in some slight performance increase. If you need performance greater than Stage IV delivers, contact the NOS Technical Support line.

At the Stage IV level, the Big Shot nitrous solenoid is flowing near maximum capability. Increasing the jetting above these levels will not result in a performance increase.

### 6.3 Determining Optimum Nitrous/Fuel Jetting

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 950 psi nitrous bottle pressure and 6 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.

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

Stabilize the nitrous bottle pressure at 950 psi.

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 the indication of lean or rich nitrous/fuel conditions (refer to Figure 8 for tips on reading the spark plugs).

2A. If spark plugs appear to be excessively rich, decrease the fuel jet size 2 steps (ex. 93 to 91, 102 to 100, 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.

#### How to Read Spark Plugs from a Nitrous Oxide Injected Engine

##### A. Correct Timing, Mixture, and Spark Plug Heat Range

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

##### B. 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.

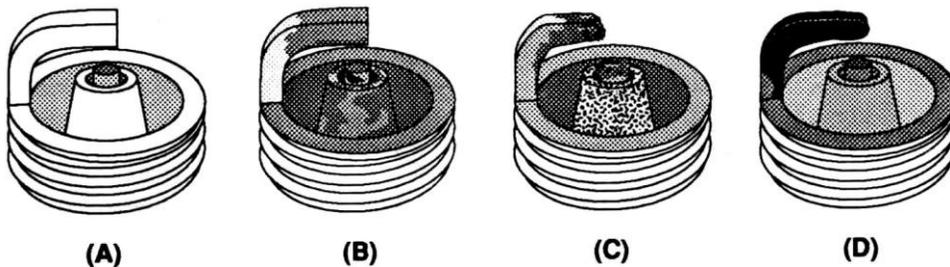
##### C. Detonation

Edges of the 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.

##### D. Excessively Lean Mixture

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.

Figure 7 Spark Plug Condition



#### 6.3.1 Determining Optimum Ignition Timing

Determining the correct ignition timing for an engine using nitrous oxide is not cut and dry as it is dependent on many variables. Variables such as piston design, combustion chamber size and design, valve angle, fuel type, nitrous system design, and other factors all play a critical role as to what timing a specific engine/vehicle combination needs. When running larger amounts of nitrous, it is critical that the proper ignition timing be run as well as the proper spark plug heat range.

There is one specific timing that is most ideal for a specific engine and nitrous tune-up. In the end the best and correct method to determine timing in a car is to read the spark plugs.

Due to all these variables, it is difficult to recommend a generic timing for a given amount of nitrous. However the information below is intended to provide a starting point. After this, it is best to use the spark plugs as an indicator as to what timing a specific engine requires. The spark plugs also will help with nitrous and fuel jetting as well as fuel pressure needs.

One large variable that drives the ideal ignition timing is the “combustion efficiency”. This is a combination of the cylinder head valve angle, combustion chamber size and burn characteristics, and piston dome design among other things. The more efficient the overall combustion efficiency is, the less timing is needed with nitrous. Note that when running large amount of nitrous, the old school rule of “take out two degrees per 50 HP of nitrous” is not ideal or wise.

The following timing recommendations below are based on nitrous HP amounts and a factor called “Combustion Efficiency”. Combustion Efficiency takes into account the piston dome, chamber size, valve angle, and other factors . It is split up into three categories, “High”, “Medium”, and “Low”. The following reviews these:

“High” – An engine with an exceptionally efficient and quick burn rate when running nitrous. Typically this would have a piston with a dish, flattop, or very small, flat dome design. Combustion chambers are small and valve angles are greatly reduced from the “factory” valve angle. Generic examples are engines with current high end race heads that have valve angles reduced 7-11 from stock, very small combustion chambers, and flat top piston that still maintain 13-14:1 compression ratios.

“Medium” – An engine with a small and efficient chamber. An example could be a SBC with an 18 degree head with a moderate piston dome.

“Low” – Older engines with factory valve angles. Pistons may have large domes to maintain high compression ratios. Large, open combustion chambers. An example would be a BBC engine with a 119cc open chamber and large dome piston.

The following are some initial recommendations for timing. Be conservative and read your plugs. Run an 1/8<sup>th</sup> mile hit rather than a 1/4 mile pass to start to see initial plug strap readings. The “Plug” recommendation is based on NGK heat ranges. An equivalent Autolite or other brand can be used.

**Note: These are for V8’s. For a 4 cylinder, cut these numbers in half.**

**Table 5 Suggested Baseline Timing Combinations**

Nitrous HP	Combustion Efficiency	Timing	NGK Spark Plug or Equiv.	Fuel/Octane
100	Low	32	Stock	93+
100	Medium	30	Stock	93+
100	High	28	Stock	93+
125	Low	31	Stock/-7	100+
125	Medium	29	Stock/-7	100+
125	High	27	Stock/-7	100+
150	Low	29	-8	100+
150	Medium	27	-8	100+
150	High	25	-8	100+
175	Low	27	-9	110+
175	Medium	25	-9	110+
175	High	23	-9	110+
200	Low	24	-9	110+
200	Medium	22	-9	110+
200	High	20	-9	110+
250	Low	22	-10	112+
250	Medium	29	-10	112+
250	High	18	-10	112+
300	Low	20	-11	114+
300	Medium	18	-11	114+
300	High	16	-11	114+

350	Low	18	-11	114+
350	Medium	16	-11	114+
350	High	14	-11	114+
400	Low	16	-11	116+
400	Medium	14	-11	116+
400	High	12	-11	116+
500	Low	12	-11	116+
500	Medium	10	-11	116+
500	High	8	-11	116+
600	Low	8	-11	116+
600	Medium	6	-11	116+
600	High	2	-11	116+

## 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 Tech Support Department at 1-866-464-6553.

PROBLEM	POSSIBLE CAUSES	DIAGNOSTIC PROCEDURE	CORRECTIVE ACTION
No change in engine speed when the fuel solenoid is activated (Preparing for Operation—Chapter 5).	System wired incorrectly.	Compare wiring to schematic in Figure 7 or 9.	Wire system per instructions.
	Restricted fuel line.	Inspect fuel line for restrictions (crimped or plugged).	Remove restrictions.
	Malfunctioning fuel solenoid.	Turn arming switch ON. Cycle microswitch or pushbutton switch. Solenoid should make “clicking” noise.	Repair/replace solenoid.
Change in engine speed when nitrous bottle valve is opened (Preparing for Operation—Chapter 5).	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(s).	Inspect filter(s).	Clean/replace filter(s).
	Low bottle pressure.	Check bottle temperature.	Set bottle temperature to 75° to 85°F.
	Inadequate nitrous supply.	Weigh bottle.	Fill bottle. 1-800-99-REFILL
	Mismatched N <sub>2</sub> O/fuel jetting.	Compare jetting to recommended values.	Install correct jets.
	Excessive fuel pressure.	Install fuel pressure gauge in the fuel line. Measure the fuel 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.	Close bottle valve. Disconnect nitrous solenoid outlet port. Disconnect solenoid (+) lead. Open nitrous bottle valve. Connect +12V to solenoid. Solenoid should discharge N <sub>2</sub> O at a high rate.	Rebuild solenoid.
No change in performance when system is activated.	System wired incorrectly.	Compare nitrous wiring to schematic (Figure 7 or 9).	Wire system per instructions.
	Loose ground wire(s).	Connect 12V test light to battery (+) terminal. Check for continuity at grounds shown in Figure 7 or 9.	Tighten/repair loose ground(s).
	In-line fuse blown.	Check fuse.	Replace fuse.

	No power to arming switch.	Connect 12V test light to battery (-) terminal. Check for power at pole #1 on arming switch.	Repair wiring.
	Malfunctioning arming switch.	Turn arming switch ON. Connect 12V test light to battery (-) terminal. Check for power at pole #2.	Replace arming switch.
	Malfunctioning pushbutton switch.	Turn bottle valve off. Turn arming switch on. Connect 12V test light to battery (-) terminal. Press pushbutton switch on. Check for continuity at pushbutton output pole.	Replace pushbutton.
	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.	<i>Inadequate fuel delivery due to:</i>		
	Plugged fuel filter(s).	Inspect fuel filter(s).	Clean or replace filter(s).
	Crimped fuel line.	Inspect fuel line.	Replace crimped line.
	Weak fuel pump.	Install fuel pressure gauge in the fuel line. Run engine under load at wide-open throttle, with system activated. Fuel pressure should be 5-7 psi.	Alter fuel pump line, as necessary.
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.
Two-Stage system does not switch between stages correctly.	Improperly wired.	Compare nitrous wiring to schematic in Figure 9.	Wire system as instructed in Section 4.5.

## Nitrous Oxide Accessories

NOS systems are calibrated for optimum performance with a bottle pressure of 900-950 psi. The pressure will change with temperature. Heater kits are thermostatically controlled to keep the bottle near 85° F to provide correct pressure. **Bottle Heater (P/N 14164NOS)** is available for 10 & 15 lb. bottles.

Insulating the bottle helps maintain pressure by keeping heat in the bottle when it's cold, or heat out when it's hot outside. The blankets are made of a rugged, easily cleaned Nylon outer shell with insulation. It's also an excellent "dress up" accessory and perfect for "covering" battle-scarred bottles. **Bottle Blanket (P/N 14165NOS)** is a 7" diameter blanket for the 10 lb. bottle.



P/N 14164NOS



P/N 14165NOS

The **2 Stage Throttle/RPM-Activated Switch (P/N 15982NOS)** allows hands-free nitrous operation and prevents nitrous from being injected at speeds above or below operator-set levels. It greatly reduces the chance of accidental engine damage. The ON/OFF levels adjust from 1 to 9999 RPM. **NOTE:**

With the 35 PSI **Adjustable Pressure Switch (P/N 15686NOS)**, you won't be blasting nitrous into the engine if the fuel pressure is below what is required to supply the required extra fuel. This fuel pressure safety switch can be adjusted to any desired setting, but is preset to 35 PSI at the factory.



**P/N 15982NOS**



**P/N 15686NOS**

The primary purpose of a **Purge Valve, P/N 16030NOS**, is to release trapped air or gaseous nitrous from the feed line(s). This helps to ensure consistent performances. And, purging looks cool too!

**Nitrous Pressure Gauges (P/N 15910NOS)** measure from 0-1500 psi (although recommended level is 900-950 psi) and are essential in monitoring the bottle.

The **Quick Release Hinged Aluminum Bracket, P/N 14140NOS**, is available for 10 lb. and 15 lb. bottles. **P/N 14147NOS** is available for the carbon fiber bottle.



**P/N 16030NOS**



**P/N 15910NOS**



**P/N 14140NOS**

## **NOS Technical Support**

**Phone: 1-270-781-9741**

**Toll Free Phone: 1-866-464-6553**

**Fax: 1-270-781-9772**

**For online help, please see our Tech Service section on our website: [www.holley.com](http://www.holley.com)**

**For bottle refill information:  
1-800-99-REFILL (1-800-997-3345)**

**A5054-1-SNOS**

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