



P/N 199R10382

# 2005 Mustang Wet Single Fogger Kit

Kit Number 02121NOS



## OWNER'S MANUAL

**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-GOHOLLEY.

**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**

- **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, 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 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 any 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.

## Chapter 1 Introduction to your NOS Nitrous Oxide Kit

### 1.1 General Information

Kit Number 02121NOS is intended for 2005 Mustang 4.6L 3 valve engines.

**NOTE:** This nitrous oxide injection system injects a mixture of nitrous oxide and fuel into the air intake duct. If the instructions are not carefully followed, poor mixture distribution can occur, resulting in variations of air to fuel ratio from cylinder to cylinder. In extreme cases, intake manifold backfires can occur, if the instructions are not followed exactly.

These kits have been designed for safety and smoothness of operation. Nitrous oxide is injected into the engine only when the following conditions are met:

- Bottle valve is opened.
- System is armed.
- Engine is at wide-open throttle.
- RPM conditions are met.

Horsepower and torque increases due to these kits will vary with engine displacement and modifications. Approximate power increase estimates can be made based upon the massflow of nitrous oxide into the engine. The following table is provided to allow you to estimate the power increase you can expect for your application. NOS **strongly** suggests that an upper limit of about 40% to 50% increase in power output from your stock engine. Exceeding this can result in premature engine failure.

**Table 1 Jetting Combinations @ 43 PSI Fuel Pressure**

<b>Kit</b>	<b>Nitrous/Fuel Jetting</b>	<b>Approximate Power Increase (BHP)</b>
02121NOS	20/16	50 HP
	36/30	75 HP

Driveability, fuel economy, and exhaust emissions should not be affected under normal (part throttle) conditions.

## 1.2 System Requirements

When used correctly, these kits will work with stock internal engine components. **To ensure proper performance and engine life, the following is an absolute must:**

### Manual Transmissions

If the vehicle is to be exposed to severe operating conditions, such as drag strip usage, the standard clutch should be replaced with a high performance unit.

### Automatic Transmissions

If the vehicle is to be exposed to severe operating conditions, such as drag strip usage, a reputable high-performance transmission shop should service the automatic transmission.

### 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. If any components are missing, please contact NOS Technical Support at 1-866-GOHOLLEY.

**Table 2 NOS 2005 Mustang 02121NOS Parts List**

Item	Description	Quantity	NOS P/N
(1)	Bottle Nut Adapter	1	16220NOS
(2)	Bottle Valve Washer	1	16210NOS
(3)	10 lb. Bottle	1	14745NOS
(4)	Bottle Mounting Bracket, Short	1	14126-SNOS
(5)	Bottle Mounting Bracket, Long	1	14127-SNOS
(6)	N <sub>2</sub> O Powershot Solenoid	1	16020NOS
(7)	Powershot Fuel Solenoid	1	16080NOS
(8)	Relay Wiring Harness	1	15604-SNOS
(9)	30 Amp Relay	1	15618NOS
(10)	4an – 1/8NPT Nitrous Filter (Blue)	1	15570NOS
(11)	Fuel Filter (Red)	1	15571NOS
(12)	4AN – 1/8 NPT Fitting (Red)	1	17961-SNOS
(13)	0.016" Flare Jet	1	13760-16NOS
(14)	0.020" Flare Jet	1	13760-20NOS
(15)	0.030" Flare Jet	1	13760-30NOS
(16)	0.036" Flare Jet	1	13760-36NOS
(17)	3AN x 2 ft. Hose (Blue)	1	15060-1NOS
(18)	3AN x 2 ft. Hose (Red)	1	15060-2NOS
(19)	4AN – 16 ft. Hose (Blue)	1	15300NOS
(20)	Nozzle Mounting Bung Nut	1	13713-SNOS
(21)	Nozzle Mounting Bung	1	13715-SNOS
(22)	Fogger Nozzle	1	13716NOS
(23)	8-32 x 5/16 Phillips Head Screws	4	16506-SNOS
(24)	Solenoid Bracket	1	49R3002
(25)	Washers	2	46R1421
(26)	Purge Switch	1	15610NOS
(27)	WOT/Window Switch	1	200R539A
(28)	Fuel Pressure Sensor Assembly	1	40R827A
(29)	Switch Panel Backing Plate	1	49R3003
(30)	Switch Panel	1	89R693
(31)	M5 x 50 mm Hex Head Screws	2	5R2218
(32)	4AN 7 1/4" in. 90° Hose	1	52R424
(33)	Rocker Switch (on/off)	2	89R694
(34)	14 Gauge Blue Wire 8 ft.	1	15751-VSNOS
(35)	4AN Red Cap Plug	1	A1001-SNOS
(36)	Basic Wire Pack	1	15612-VSNOS
	Rocker Switch	1	15602NOS
	15 amp Fuse	1	208R2
	Microswitch	1	15640NOS
	4-40 x 1 SL PAN HD M Screw*	2	15647-SNOS
	4-40 Hex Nut*	2	15648-SNOS
	1/4" Ring Terminal	3	15882-SNOS
	Blue Female Spade Terminal .25	7	15885B-SNOS
	Blue Male Spade Terminal .25	1	15886B-SNOS
	Scotchlock	1	15891-SNOS

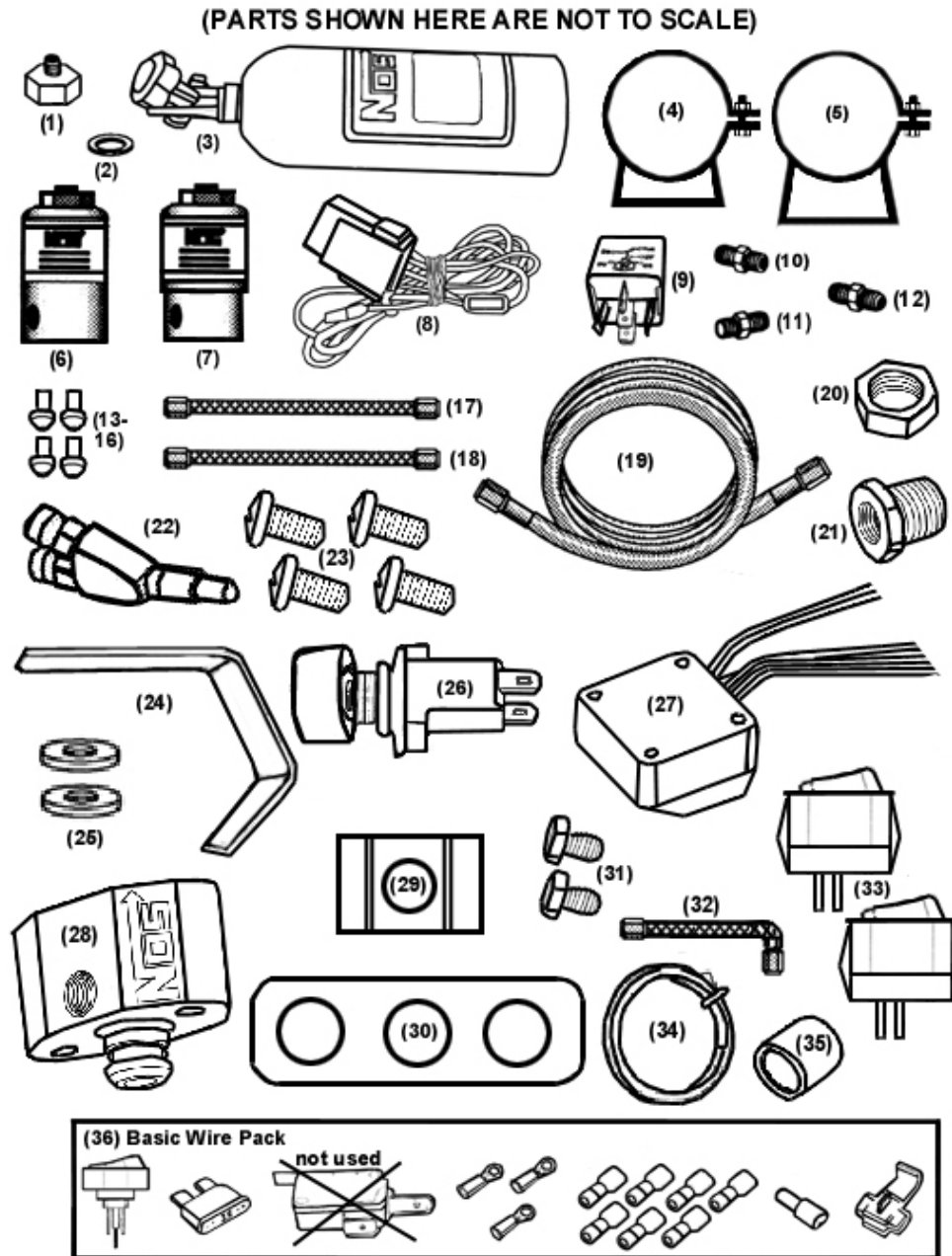


Figure 1 Kit #02121NOS Wet Kit Components

## Chapter 2 Kit Installation

### 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. Mount the bottle away from heat sources, such as the engine compartment or exhaust system, and away from windows, where the bottle is exposed to direct sunlight.

#### 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 that the bottle be mounted within the confines of the safety roll cage with the safety pressure relief cap vented away from the driver's compartment.

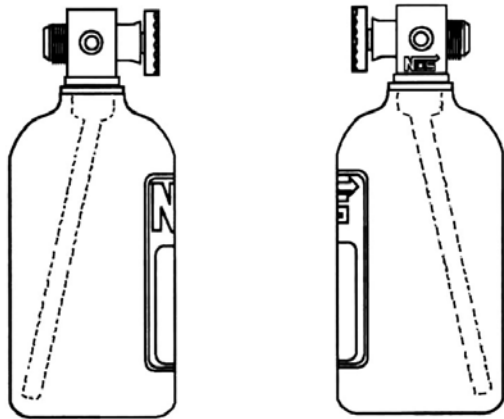


Figure 2 Nitrous Bottle Siphon Tube Orientation

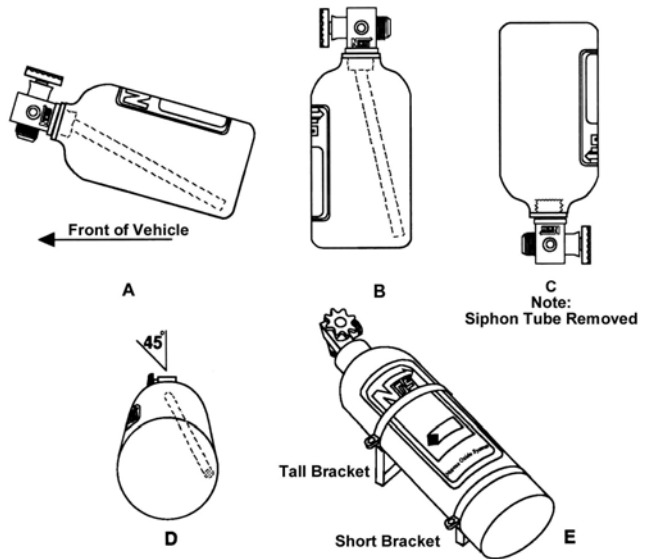


Figure 3 Nitrous Bottle Mounting Orientations

## 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  $45^\circ$  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).

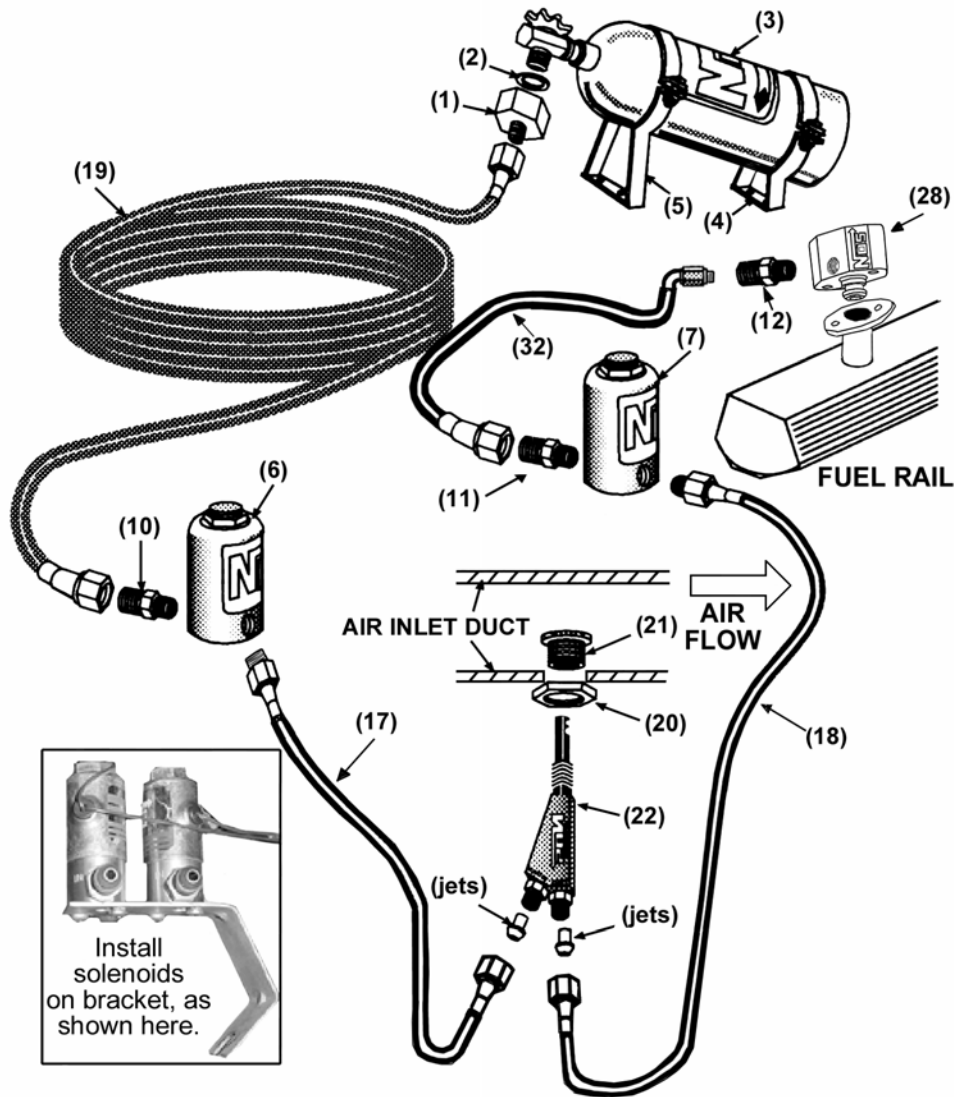
The most efficient mounting is the lay-down position (Figure 3A) with the valve handle toward the front of the vehicle. This position allows the greatest amount of liquid to be used before the siphon tube begins to pick up gaseous nitrous oxide.

## 2.3 Bottle Installation

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

**NOTE:** Numbers in parentheses ( ) refer to the parts list / assembly drawing number for the component. Figure 4 shows the installation assembly for the Universal Wet NOS system.





**Figure 4 Exploded View of Kit #02121NOS Wet NOS System**

1. Install the bottle nut adapter (1) and Teflon washer (2) on the nitrous bottle (3). Tighten securely.
2. Loosely install the bottle mounting brackets (4 & 5) on the nitrous bottle, as shown in Figure 3E.
3. Locate the bottle/bracket 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 and drill four 5/16" holes in the mounting surface.

**CAUTION! When drilling or punching holes for these brackets, be aware what component, wires, 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 or No. 12 sheet metal screws).
6. Secure the nitrous bottle in the mounting brackets and tighten the bracket clamps.

#### **2.4 Soft Plume Nozzle Installation**

**NOTE:** The recommended mounting location for the Soft Plume nozzle is in the air inlet duct, between the throttle body and the mass airflow sensor (in applications where a mass airflow sensor is used). Install the nozzle (as shown in Figure 5) before the throttle body or any major turn in the air inlet duct. **See Figure 5.**

1. Before making any permanent modifications to the vehicle, layout the location of all the major components (solenoid, nozzle, fuel/nitrous supply lines, etc.).

2. Install the Soft Plume Nozzle (22), taking into account the length of the nitrous and fuel supply hoses and the intended location of the solenoids. Take into account that the nozzle mounting bung (21) needs to be restrained during final installation, and accessibility of a tool is important. Make sure the nozzle and feed lines will not interfere with engine components or accessories and will not interfere with the hood when closed. The nozzle should not move from the perpendicular position in the air inlet duct due to strain induced by the nitrous and/or fuel supply hose.
3. Remove the air inlet duct.

**CAUTION!** All debris **must** be removed from the air inlet duct. Use compressed air, if available. Failure to do so can result in severe engine damage.

- 3A. **Mounting Surface:** Drill a 7/16" hole perpendicular to the inlet duct centerline through the inlet duct. Insert the Soft Plume nozzle mounting bung (21) into the 7/16" hole with the head inside the duct. Use Loctite or a similar compound on the nozzle adapter threads and securely tighten the nozzle mounting bung nut (20) to the nozzle mounting bung (21). This hole should be drilled onto the bottom (towards the underside of the car) of the air intake tube.

**CAUTION!** Severe engine damage can occur if the nozzle adapter / nozzle assembly works loose from the air inlet duct. Ensure that the Soft Plume nozzle is securely tightened in the air duct.

4. Note the discharge side of the Soft Plume nozzle. Install the Soft Plume nozzle in the inlet duct with the discharge side pointed toward the engine (downstream or in the direction of the induced air stream). Use Teflon paste to ensure adequate sealing.
5. Install the air inlet duct.

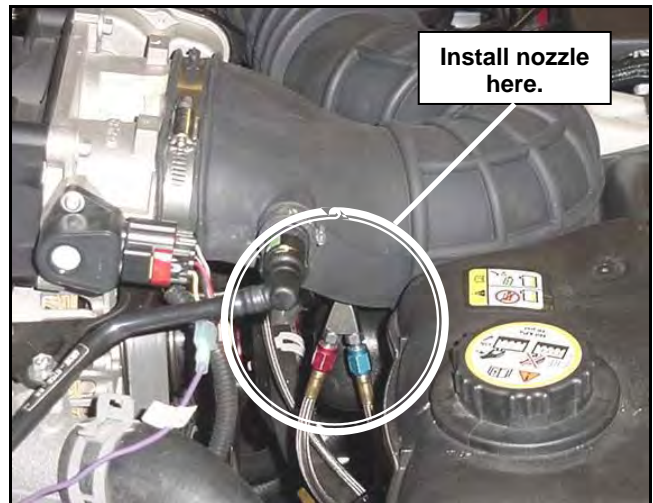
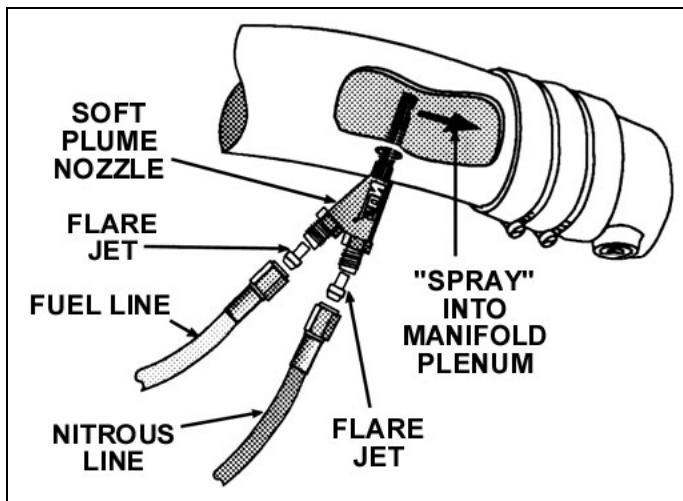


Figure 5 Soft Plume Nozzle Installation Cut-Away & Installation Photo

## 2.5 Solenoid Mounting

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

1. Clamp the nitrous solenoid (6) in a bench vise.
2. Thread the 1/8" NPT x 4AN nitrous filter fitting (10) into the inlet port of the nitrous solenoid. Use Teflon paste to avoid leaks.
3. Thread the 1/8 NPT male end of the blue 2 ft. 3AN hose (17) into the outlet port of the nitrous solenoid. Remove from the vise.
4. Clamp the fuel solenoid (7) in a bench vise.
5. Thread the 1/8" NPT x 4AN Fuel Filter Fitting (11) into the inlet port of the fuel solenoid. Remove from the vise.
6. Thread the 1/8 NPT male end of the red 2 ft. 3AN hose (18) into the outlet port of the fuel solenoid. Use Teflon paste to avoid leaks.
7. Attach the nitrous solenoid to the solenoid mounting bracket (24). Attach the fuel solenoid to the solenoid mounting bracket (24). **See Figure 6.**



**Figure 6**

8. Mount the solenoid assembly to the driver's side foremost valve cover bolt. **See Figure 6.** Ensure that the assembly and lines do not interfere with engine accessories or body parts, and that hoses reach the Soft Plume nozzle inlet ports without being stretched or kinked.
9. Securely mount the solenoid assembly.

## **2.6 Solenoid / Soft Plume Nozzle Hose Connection**

1. Select the proper nitrous and fuel jets (13-16). Place the desired jets in the Soft Plume nozzle, making sure that the jets are inserted into the correct locations, as marked on the nozzle.
2. Connect and tighten the open end of the blue 2 ft. 3AN hose (17) to the Soft Plume nozzle inlet port marked "nitrous". Hold the Soft Plume nozzle in position with a wrench to ensure the nozzle doesn't rotate out of position when the line is tightened.
3. Connect and tighten the open end of the red 2 ft. 3AN hose (18) to the Soft Plume nozzle inlet port marked "fuel". Hold the Soft Plume nozzle in position with a wrench to ensure the nozzle doesn't rotate out of position when the line is tightened.

## **2.7 Nitrous Feed Line Mounting**

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

1. Determine the route for your nitrous feed line to follow. Ensure the path is clear of exhaust system, suspension, steering, wheels, electrical lines and components, and tires.
2. Feed the nitrous supply line (19) 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 4AN bottle nut adapter (1) on the nitrous bottle.

**WARNING! Nitrous oxide can cause death if inhaled. Severe frostbite can occur, if allowed to contact the skin. Always point the nitrous line opening away from people when purging the line.**

5. Attach the nitrous supply line to the filter installed in the nitrous solenoid inlet port.

## **2.8 Fuel Supply Connection**

1. Remove the fuel pressure sensor from the fuel rail. This sensor is located on the driver's side of the engine and is attached to the fuel rail with two 8mm headed bolts. **See Figure 7.**

**WARNING! Do not use Teflon Tape on any 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.**

2. Install the 4AN fitting (12) into the injector block with Teflon paste, while secured in a soft jaw vise. Tighten securely. See **Figure 9**.

**WARNING! Do not tighten fittings while installed on the fuel rail. Install these while secured in a soft jaw vise.**

3. Thread the 90° end of the 6" 4AN hose into the fitting in the injector block (hand tighten and add a 1/2 turn). See **Figure 10**.
4. Insert the "injector block" with O-ring pressed into the rail. Lube the o-ring with o-ring lube or Vaseline. See **Figure 11**.



**Figure 7**



**Figure 8**



**Figure 9**



**Figure 10**



**Figure 11**

5. Using the supplied bolts and washers, tighten the injector block down after installing the fuel pressure sensor on top.

**CAUTION! All debris must be removed from the fuel rail. Failure to do so will result in an engine failure.**

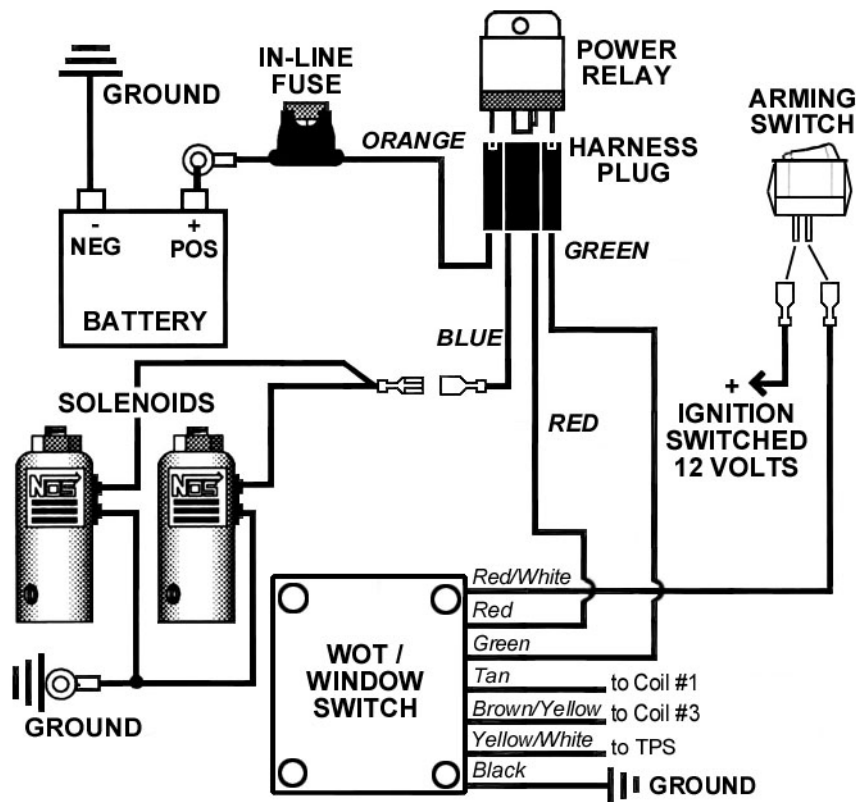


Figure 12 Electric Wiring Schematic

## 2.9 Electrical System Installation (WOT/Window Switch)

Refer to Figure 12 and the 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).
2. Install the WOT/Window Switch (27) as follows:
  - A. Find a suitable mounting location away from heat and vibration (ex. firewall).
  - B. Loosely route the WOT/Window Switch wires to the locations found on the drawing.
  - C. Route the Red / White wire from the WOT/Window Switch through the firewall. Route the wire as close to the center console as possible
3. Install the NOS arming switch panel (leftmost switch) in the vehicle interior next to the power outlet, within easy reach of the driver. **See Figures 13-17.** The NOS arming switch panel included in this kit has switches included for a bottle heater (NOS P/N 14164NOS and 14169NOS), and an NOS purge (NOS P/N 16030NOS) which can be purchased separately. Either the left most, or right most rocker switch can be used for a master arming switch. The middle pushbutton switch is designed for a purge only. The arming switch is to be used to activate the nitrous system once safe engine RPM levels are reached.

**NOTE: Refer to the factory service manual for center console removal.**



Figure 13

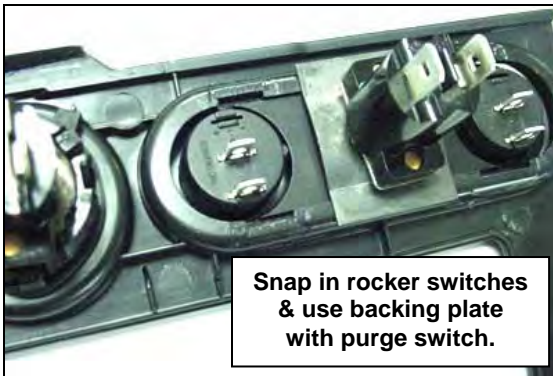


Figure 14

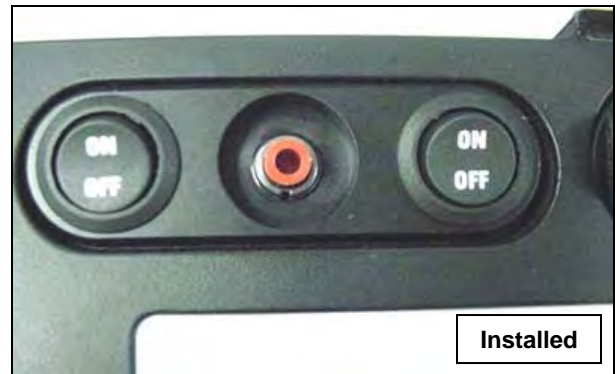


Figure 15



Figure 16



Figure 17

4. Install the wiring relay and relay harness 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. Install a 15 AMP fuse into the fuse socket.
6. Connect one wire from each solenoid together. Join the solenoid wires to the blue relay wire.
7. Join the remaining solenoid wires together. Connect to a good chassis ground.
8. Connect the WOT/Window Switch wire to the green relay wire and then to a good chassis ground.
9. Connect red relay wire solid red wire on the WOT/Window Switch.
10. Connect the tan wire of the WOT/Window Switch to coil #1 (cylinder 1) on the Mustang (white / pink stripe wire on car). **See Figure 18.**

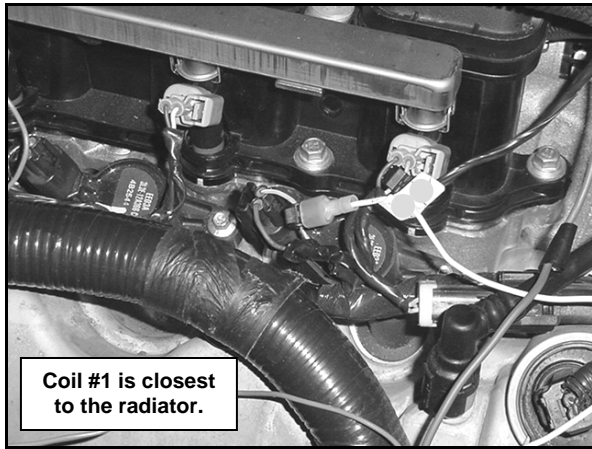


Figure 18

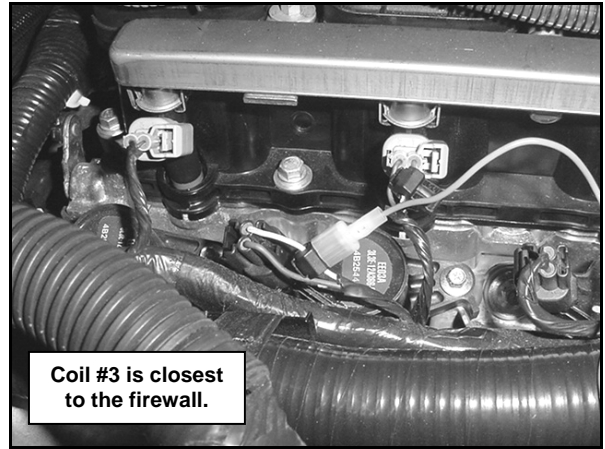


Figure 19

11. Connect the brown / yellow striped wire on the WOT/Window Switch to the green / white striped wire of coil #3 (cylinder 3) on the car. **See Figure 19.**
12. Connect the black wire of the WOT/Window Switch to a ground.
13. Connect the yellow / white striped wire on the WOT/Window Switch to the yellow / white striped on the car TPS sensor. **See Figure 20.**

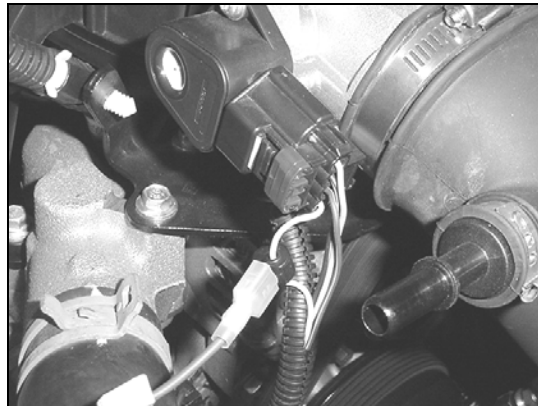


Figure 20

14. Connect the red / white striped wire on the WOT/Window Switch to the upper pin of the arming switch in the dash.
15. Connect the lower pin of the NOS arming switch to a 12 volt switched power source in the car.
16. If these steps are verified, proceed to the next section.

**NOTE:** The NOS WOT/window switch is preset to activate the TPS at 4.3 volts. The rpm portion of the WOT/Window switch activates the solenoids at 3000 rpm, and turns them off at 6000 rpm. This is the recommended factory preset for the WOT/Window switch. To verify the WOT/Window switch operation or to troubleshoot this switch refer to the WOT/Window switch troubleshooting section. See Figure 21.



Figure 21 = Default Settings

## 2.10 WOT/Window Switch Troubleshooting- Verifying the operation of the NOS WOT/Window Switch

**NOTE:** NOS highly recommends that the user NOT change the factory WOT/Window Switch settings. The WOT/Window Switch should be set at the - 3000 rpm (low) and 6000 rpm (high) - default settings. **With the NOS WOT/Window Switch, these values are adjustable, but altering them is not recommended.** The NOS WOT/Window Switch also has a TPS/Microswitch built into the unit. The default and recommended setting is 4.3 volts. This setting ensures that the NOS nitrous system will only activate at FULL THROTTLE above 3000 rpm, and that it SHUTS OFF at 6000 rpm.

**NOTE:** The NOS WOT/Window Switch needs to be connected to cylinders that fire one after another. In other words, the first (coil #1 wire) needs to be connected to a cylinder which fires before another. In this case, cylinder #1 (coil 1 wire on WOT/Window switch) fires before cylinder #3 (coil #3 wire on WOT/Window switch). If these wires are installed opposite of this, the WOT/Window switch will not activate properly.

1. To verify the operation of the NOS WOT/Window Switch, first remove the 4 screws that hold the cover onto the WOT/Window Switch box.

**IMPORTANT! Disconnect the solenoid control wires! Make sure the nitrous bottle valve is closed!**

2. The lower left and top left dials set the maximum and minimum RPM at which the nitrous turns on or off.

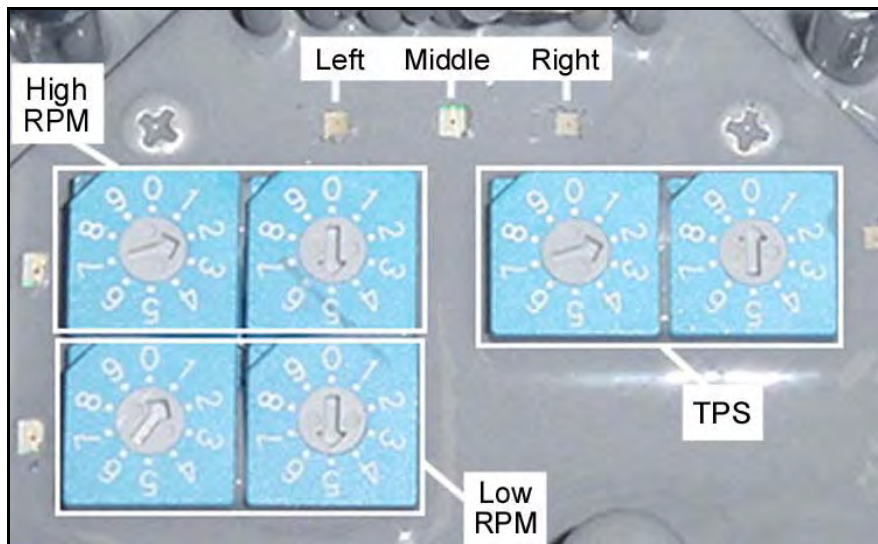


Figure 22

3. Set the lower left dial to 1 and lower right dial to 5. Set the upper left dial to 2 and the upper right dial to 5. This sets the RPM Window to turn nitrous on at 1500 RPM and off at 2500 RPM. Set the TPS left dial to 2 and the TPS right dial to 0. This sets the TPS to turn on at 2.0 volts or about 1/4 to 1/2 throttle. **See Figure 22.**

**IMPORTANT! Make sure that the nitrous and fuel solenoids are disconnected before proceeding!**

4. Verify the RPM operation by starting the vehicle.

**CAUTION! EXERCISE EXTREME CAUTION WHILE TROUBLESHOOTING THE WOT/WINDOW SWITCH, AS WORKING AROUND A RUNNING ENGINE IS EXTREMELY DANGEROUS! SECURE ALL LOOSE CLOTHING AND ITEMS TO SAFEGUARD AGAINST CONTACT WITH THE ENGINE! ACTIVE NITROUS AND FUEL SYSTEMS ARE EXTREMELY DANGEROUS!**

5. Have an assistant watch the top row of LED lights in the WOT/Window Switch box, while slowly bringing the engine speed to 1500 RPM. The top left LED (RPM window) should illuminate at or above 1500 RPM.
6. Next, bring the engine speed to 2500 RPM. The top left LED should still be lit while the throttle is depressed approximately half way. Once all the LED lights illuminate, the NOS system is active. After 2500 RPM is reached, the middle LED (System Activation) & left LED (RPM) should turn off.
7. If these steps are verified, the NOS WOT/Window Switch is operating normally.
8. Reset the dials to the default settings (3,000 rpm low and 6,000 rpm high) for on and off. Also, reset the TPS to 4.3 volts (TPS left dial to 4 and TPS right dial to 3). If there are further issues with the WOT/Window Switch, please contact NOS tech service with any questions.



## Chapter 3 Routine Maintenance

### 3.1 Nitrous Solenoid Filter

When nitrous bottles are refilled they can become contaminated with debris, if the refiller does not have an adequate filter in their 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. Empty the main nitrous feed line.
2. Disconnect the main nitrous feed line from the nitrous solenoid. Remove the nitrous filter fitting from the nitrous solenoid.
3. Remove **all** Teflon paste debris from the solenoid inlet port threads and from the nitrous solenoid filter pipe threads.
4. Examine the mesh in the nitrous filter fitting for contaminants. Blow out debris with compressed air, if necessary.
5. Apply fresh Teflon paste to the nitrous filter pipe threads. Reinstall the filter in the nitrous solenoid.
6. Reconnect the main nitrous supply line to the nitrous solenoid.

### 3.2 Nitrous Solenoid Plunger

#### 3.2.1 General Information

The seals used in NOS nitrous solenoid plungers are constructed from materials that 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.

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 seal swelling or in extreme cases, plunger seal disintegration.

**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).

#### 3.2.2 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 16665-SNOS). **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.

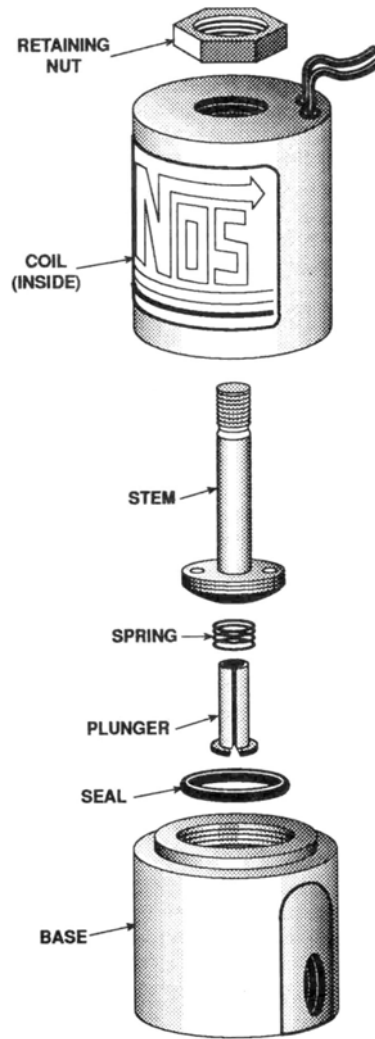


Figure 23 Exploded View of a Typical Solenoid

## 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 the NOS Technical Support at 1-866-GOHOLLEY.

PROBLEM	POSSIBLE CAUSES	DIAGNOSTIC PROCEDURE	CORRECTIVE ACTION
No change in engine speed when the fuel solenoid is activated (Preparing for Operation—Chapter 4).	System wired incorrectly.	Compare wiring to schematic in Fig. 12.	Wire per instructions.
	Restricted fuel line.	Inspect fuel line for restrictions (crimped or plugged).	Remove restrictions.
	Malfunctioning fuel solenoid.	Turn arming switch ON. Cycle the microswitch. Solenoid should make “clicking” noise.	Repair/replace solenoid.
Change in engine speed when nitrous bottle valve is opened (Preparing for Operation—Chapter 4).	Malfunctioning nitrous solenoid.	Remove and inspect solenoid.	Repair/replace solenoid.
Engine runs rich when nitrous 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 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, such as NOS P/N 15906NOS, 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.	<b>WARNING: Solenoid discharges nitrous at a high rate. Don't inhale nitrous; death may occur. Skin contact may cause frostbite.</b> Close bottle valve. Disconnect the nitrous solenoid outlet port. Disconnect the solenoid (+) lead. Open the nitrous bottle valve. Connect the +12V to the 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 12).	Wire system per instructions.
	Loose ground wire(s).	Connect 12V test light to battery (+) terminal. Check for continuity at grounds noted in Fig. 12.	Tighten/repair loose grounds.
	Malfunctioning arming switch.	Turn arming switch on. Connect 12V test light to battery (-) terminal. Check for power at pole #2.	Replace pushbutton
	No power to arming switch.	Connect 12V test light to battery (-) terminal. Check for power at pole #1 on arming switch.	Repair wiring.
	Malfunctioning throttle microswitch.	Temporarily disconnect power relay red wire from microswitch. Connect 12V test light to battery (-) terminal. Manually set microswitch ON. Check for continuity at microswitch positive terminal (Fig. 12).	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.
	Inadequate octane fuel.		Use higher octane fuel.
	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 15906NOS, in the fuel line. Run engine under load at wide-open throttle, with system activated. Fuel pressure should be within 5 PSI of fuel pressure at idle.	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 (Figures 2 & 3).	Mount or orient bottle correctly.

## 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.

The **Remote Bottle Valve (P/N 16058NOS)** is the perfect convenience accessory—it electronically turns the 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.



P/N 14164NOS



P/N 14165NOS



P/N 16058NOS

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.

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 15686NOS



P/N 16030NOS



P/N 15910NOS



P/N 14140NOS

For those who want the ultimate in appearance, NOS offers many popular bottles that are fully polished. **P/N 14745-PNOS** is our 10 lb. fully polished bottle. For optimum weight reduction and distinctive high-tech looks, these DOT-approved NOS carbon fiber-wrapped bottles are it! It weighs about half of the standard bottle (empty). **P/N 14747NOS** has 12.5 lb. capacity.



P/N 14745-PNOS



P/N 14747NOS

To order, contact your local NOS dealer.

### NOS Technical Support

Toll-Free Phone: 1-866-GOHOLLEY, Phone: 1-270-781-9741, Fax: 1-270-781-9772  
For online help, please refer to the Tech Service section of our website: [www.holley.com](http://www.holley.com)  
For bottle refill information: 1-800-99-REFILL

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Date: 11-10-05