



INSTALLATION AND TUNING INSTRUCTIONS

INTRODUCTION

Congratulations on your purchase. Now, that you're fully equipped with the latest technology from NitrousWorks, the high-performance world of nitrous oxide awaits you.

However, despite the natural impulse to have the kit installed in record time and an unbridled desire to go out and test it, please read the following information first. It's important you understand all aspects of these instructions, prior to the installation of your new system. Let's begin by taking a brief look at the basics of nitrous.

Adding nitrous oxide to an internal-combustion engine is the most cost-effective way of increasing its performance. Nitrous is rich in oxygen which is a vital component for making more power. By introducing nitrous oxide to the combustion chamber, more fuel can be burned as a result of the higher oxygen content, and the engine will produce more power.

This formula works without exception, providing the correct amount of fuel is added to the combustion chamber to match the nitrous charge. If fuel is not added to the nitrous, or if the amount of fuel is insufficient, the resulting incorrect mixture will bring about leanness. This is an undesirable condition that causes combustion temperatures to increase rapidly, and one that has the potential to inflict severe engine failure.

The nitrous system comprises four main components: nitrous delivery system, fuel delivery system, delivery nozzle, and electrical system. Let's look at each of these with regard to installing and tuning. Testing the system will be discussed along with some general tips.

NOTE: BEFORE ANY WORK BEGINS, DISCONNECT THE POSITIVE BATTERY TERMINAL.

Proper use of a nitrous system requires the user to have a working knowledge of how the system operates. Please read the following information.

1. Leaking nitrous solenoids will cause probable engine damage as raw nitrous "leans out" the intake charge. Without the extra fuel, pistons burn, plug tips disappear, and piston rings can become annealed.
2. Raw nitrous that seeps into the intake plenum with the engine off can cause backfire/explosions upon re-starting of the engine.
3. Do not operate this or any nitrous system without proper fuel and nitrous filters. The filters will trap contaminants before they enter the solenoids and cause malfunction.
4. Inadequate fuel delivery systems will cause lean out in the nitrous system. Street systems require a minimum of 4 P.S.I. at full throttle, Race systems minimum 5 P.S.I. Check your fuel system's capability using NitrousWorks's flow check , **Part # 16014**.
5. Your NitrousWorks installation kit is designed to be used with a NitrousWorks safety shut-off valve, **Part # 22011**. This manually operated valve should be mounted through the floor near the driver's seat within easy reach.
6. NitrousWorks strongly recommends the use of the safety system, **Part # ????** , on all street systems to avoid the problems mentioned above.

SPECIAL INSTRUCTIONS FOR DIRECT PORT INJECTION UNITS

1. After deciding the correct location for each port injector nozzle, mark each location. Drill and tap carefully.
2. Install injector nozzles with a tiny drop of sealant. Aim injector nozzle to provide optimum flow direction.

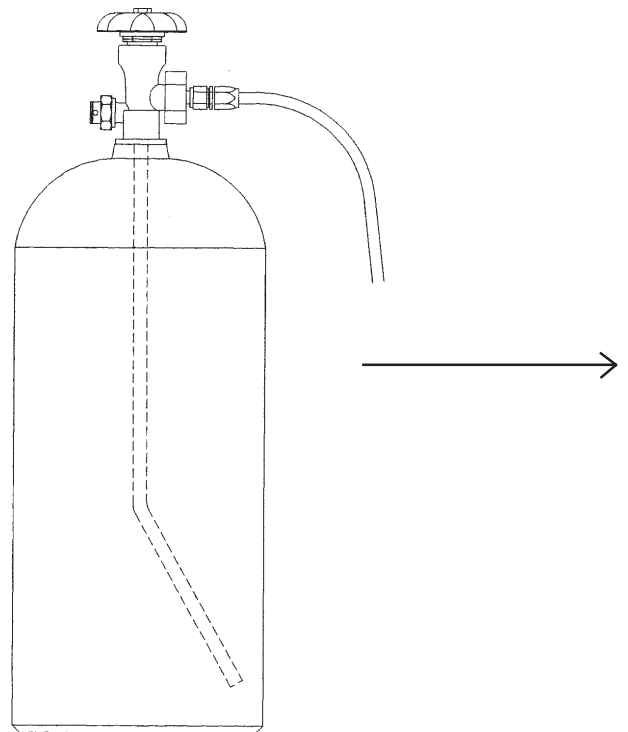
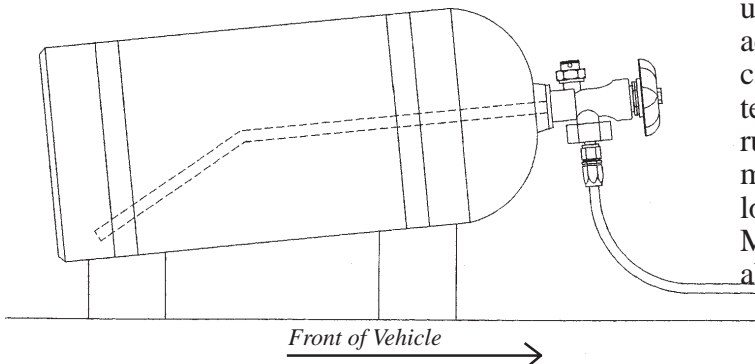
3. Assemble distribution block using fittings provided and a small drop of pipe sealant.
4. Decide on the best location for the distribution block to be located. Be certain the location provides adequate clearance for lines to lead to and attach to block.
5. Carefully bend lines from the closest to the block, working outward. Bend a line, slip on the ends, single flare with a flaring tool.
6. After completing all lines, snug down all fittings.
7. Connect solenoid output lines to distribution block.
8. Connect fuel output line to fuel solenoid end marked out. Connect nitrous output line to nitrous solenoid end marked out. Securely mount solenoids.

REMAINDER OF INSTALLATION INSTRUCTION ARE THE SAME AS ANY OTHER PLATE SYSTEM. THEREFORE REFER TO INSTRUCTION PACKAGE.

NITROUS DELIVERY SYSTEM

The nitrous-oxide cylinder should be mounted in the trunk, or similar area, but not in the driver's compartment. The positioning of the cylinder must be executed as shown in the diagrams below to ensure the siphon tube remains covered with liquid nitrous. Either installation is acceptable, use the layout that suits your vehicle best.

When mounting the cylinder/bottle in the horizontal position, assemble the brackets on the cylinder and use them as a template for marking the positions of the eight, 5/16" mounting holes. In this position, the valve end will be higher than the bottom of the cylinder; the valve will be pointing forward and the valve outlet facing downwards.

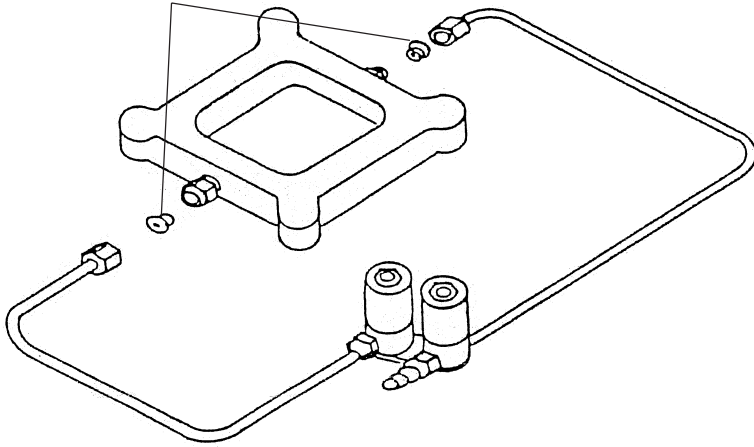


NOTE: BE SURE NOT TO PUNCTURE THE FUEL TANK OR ANY OF THE FUEL LINES ETC. WHEN DRILLING.

The smaller fitting, opposite the valve outlet, is for pressure relief. Should the cylinder exceed 3000psi, the relief fitting will expel the contents of the cylinder. **Cars competing under IHRA regulations are required to have this relief fitting vented to the outside of the car. To comply, NitrousWorks offer an IHRA-legal relief valve, part number 16024.** It's threaded to accept either an external vent tube or braided-steel hose with a -8AN hose end. The other end of the hose can be fixed to a -8 AN bulkhead fitting (part number 150887) to exit the car.

There are several ways in which the nitrous supply line can be routed to the engine compartment. Some suggestions include running it under the carpet, under the kick-panel moldings, or under the floor panel. Anyone of these methods is acceptable. Ensure the line is secure, that it cannot be tugged out of position, and it's protected from blows that could cause the line to rupture. Route the line into the engine compartment towards the area where the air inlet tube is located and where the nozzle will be installed. Make sure the line has a small amount of slack to absorb any engine-to-chassis movement.

Changeable orifices



MOUNTING YOUR INJECTOR PLATE ASSEMBLY

Note: Before any modifications are made under the hood, we strongly recommend taking a few moments and making a diagram of all hose, linkage, and electrical connections near the carburetor.

1. Carburetor Removal

Remove the four bolts attaching the carburetor to the manifold. Carefully remove all lines and linkage making note where they belong for re-installing. Remove the carburetor and clean gasket surface on both manifold and carburetor.

2. Installing the Injector Plate Assembly

All NitrousWorks injector plates are marked TOP to avoid confusion. On the Quadrajet injector plate, make sure the small bores face the front of your engine. Use the new carburetor gaskets supplied and the longer mounting hardware for the carburetor.

3. Replace the Carburetor

Replace the carburetor and accessory connections. Use the preceding disassembly instructions in reverse order to replace all components except the air cleaner.

RUNNING YOUR NITROUS SUPPLY LINE

There are several ways your supply line may be routed (under the rug, under the kick panel moldings, or under the floor panel). Any method is fine, just be certain the line is secure and cannot be tugged out of position. Connect the nitrous line to the nitrous oxide cylinder. Route your line through to the engine compartment. Make sure

the line still will have a small amount of slack, to absorb any engine-to-chassis movement.

MODIFYING YOUR FUEL SYSTEM

There are two methods of supplying fuel to your nitrous system. **Method A** is to be followed if your system was designed for **less than 175 horsepower** increase. **Method B** is to be followed if your kit is adding **over 175 extra horsepower**.

METHOD A

Find a suitable location (away from fan, pulleys, belts, exhaust heat and moving suspension parts) to splice into the fuel line and add the fuel tee supplied. Attach a rubber fuel line between the new fuel tee, and the nitrous systems fuel solenoid. Make sure all clamps are tightened sufficiently. Your fuel supply is now complete.

METHOD B

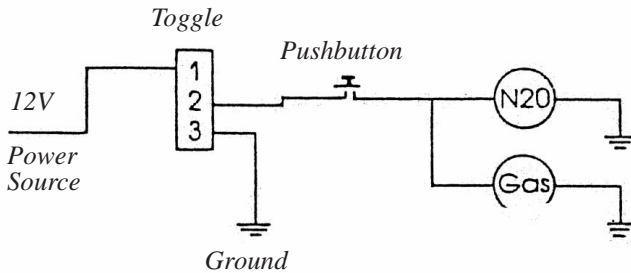
On high horsepower systems, a major problem is inadequate fuel supply to handle both the carburetor system and the nitrous oxide unit. On large units your fuel demands may more than double! These competition units require high output fuel systems, including a high flow electric fuel pump accompanied by a fuel pressure regulator. Nitrous units with output below 250 horsepower will operate with a minimum fuel line inner diameter of 3/8".

On nitrous systems providing an increase around 250 horsepower or higher we highly recommend running a separate fuel system for both carburetors and your nitrous systems. Preparation of a separate fuel tank outlet, electric fuel pump, 1/2" fuel line, fuel pressure regulator, and fuel pressure gauge, will insure adequate supply to both your carburetion and your nitrous system.

OPTIONAL FUEL PRESSURE MONITOR SYSTEM REQUIRED BY THE IHRA

The optional fuel pressure monitor switch monitors the volume of fuel supplied to your nitrous system. On higher horsepower kits, low pressure in your fuel supply could damage your engine. On our small to moderate units, our built-in safety margin makes engine damage highly unlikely unless total fuel supply failure results.

The pressure monitor should be placed in the fuel line directly before the fuel pressure regulator. In this manner the monitor judges fuel pump output, and not what you are regulating it down to. Run a ground wire from either terminal on the pressure monitor to a good chassis ground.



ELECTRICAL CONNECTIONS

1. Your 12-volt source should be taken from the fuse panel marked accessory/switched. This will insure the nitrous cannot be injected with the engine shut off.

On high horsepower racing systems more amperage is required, and the 12-volt source should be taken directly off the battery with 14 gauge wire.

2. Be sure all connections are insulated properly to avoid possible shorting.

3. Take one wire from each solenoid (it doesn't matter which) and ground to carburetor or frame if pressure monitor is not needed. If pressure monitor is being used, connect the two wires to the remaining terminal on the pressure monitor.

4. Connect your toggle switch (either terminal) to the 12-volt source. Connect the remaining toggle switch terminal to the nitrous firing switch (either terminal). Connect the remaining firing switch terminal to the two remaining solenoid wires.

Your NitrousWorks system is ready to be tested.

TESTING THE SYSTEM

NOTE: AT THIS POINT, RECONNECT THE POSITIVE BATTERY TERMINAL.

The first thing to check is the wiring. If a Hobbs switch is included in the wiring layout, it will be necessary to build a small jumper, or remove it from the system temporarily. Unless exposed to pressure, a Hobbs switch will not close the circuit. These tests need to be performed with the engine switched off.

With the ignition key in the 'on' position, the engine not running and the toggle switch in the 'off' position, depress the full-throttle switch and any optional momentary switches. Nothing should happen. Now, perform the same test with the toggle switch in the 'on' position. This time the solenoids should click. If they do, the wiring is correct. This test applies to either wiring scheme.

To check for fuel leaks, start the car and inspect the fuel fittings and the solenoid inlet fitting. If the fuel system is leak-free, switch off the engine.

CAUTION: NITROUS IS EXTREMELY COLD AND CAN CAUSE BURNS SIMILAR TO FROSTBITE. USE CAUTION WHEN HANDLING NITROUS.

To check for nitrous leaks, open the cylinder/bottle valve to examine both the connection at the valve and the connection at the solenoid inlet fitting. Remove the nitrous supply line at the nozzle and check for nitrous in the line (caution: very cold). Any sign of weeping in this area would indicate a leaking solenoid. If no leaks are found, close the cylinder valve and bleed the lines. This can be accomplished by loosening the line nut at the cylinder valve. If any leaks are found at the fittings, tighten the line nut. If leaking persists, close the cylinder valve and remove the line for inspection. Contact the NitrousWorks technical staff at (706) 864-7009.

TUNING TIPS

NOTE: TO OVERCOME THE INCREASED COMBUSTION PRESSURES CUSTOMARY WITH NITROUS USE, IT MAY BE NECESSARY TO DECREASE THE PLUG GAPS, OR INSTALL AN IGNITION PERFORMANCE ENHANCER SUCH AS AN

MSD-6AL, OR SIMILAR, TO REDUCE THE PROSPECT OF BACKFIRE OR OTHER DETRIMENTAL EFFECTS.

All NitrousWorks systems are calibrated to operate with a cylinder/bottle pressure of 1000-psi. Running with a pressure lower than this will cause the system to operate in a rich condition, and make the vehicle seem sluggish - producing power 'in waves'. If the cylinder pressure exceeds the 1000-psi mark, the system may become lean, which as discussed earlier, can cause severe engine damage. The best way to monitor cylinder pressure is to install a gauge and in-line adapter (Part. Number 16005 [-4] or Part Number 16013 [-6]).

Along with cylinder pressure, specified jetting changes can be made to affect the richness or the leanness of the kit. The larger the fuel jet, the richer the system and, conversely, smaller jets create leanness. The kits are designed to function with a fuel system operating at 40-psi. You may need to adjust the jetting based on the fuel pressure (go up or down a size or two). A telltale sign of richness is a black exhaust. One can also look at the spark plugs. If the plug is black and wet, the system is rich. If the plug is white or has a semi-burned tip, the system is lean. Remember, in order to get a good sparkplug reading, one must check the plugs immediately after a run, not after a drive back to the pits.

NOTE: WHEN TUNING A NITROUS KIT FOR PEAK PERFORMANCE, IT IS ALWAYS BETTER TO ERR ON THE RICH SIDE THAN THE LEAN. A RICH CONDITION MAY LACK PERFORMANCE BUT, UNLIKE A LEAN CONDITION, IT'S LESS LIKELY TO DAMAGE ENGINE PARTS.

Finally, ignition timing can also play a key role in nitrous tuning, and retarding it by 2 - 4 degrees is a good rule of thumb. Further retardation may be necessary on larger kits to prevent detonation.

For further questions, please contact our technical department at (706) 864-8544.

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