



1 2 3 4 CYL. Direct Port Carbureted & EFI Motorcycle Applications

CONGRATULATIONS on purchasing your DynoTune 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 our system, call DynoTune Technical Service at 1-978-562-6040.

NOTICE: Installation of this DynoTune INC. Nitrous oxide system product 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 motorcycle/quad or the vehicle the purchaser intends to install the product on.

DynoTune 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.

DynoTune neither recommends nor condones the use of products manufactured or sold by DynoTune INC. on vehicles, which may be driven on public roads or highways, and assumes no responsibility for damages incurred by such use. This kit is for off road use only!

DynoTune does not recommend or condone the use of its products in illegal racing activities.

DynoTune has not pursued California Air Research Board (CARB) exemptions for this kit, hence, they are not legal for use on pollution-controlled motorcycles/atv's in California. A correctly installed DynoTune 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 DynoTune 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 or modify system components. 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 Dynotune on the bottle before using. If the bottle is not identified to show the gas contained, call Dynotune INC.
- ❑ 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 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 motor sport applications, Nitrous is 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).
- Increase 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 DynoTune 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 the supplied wire when installing electrical system components.
- Use high-quality connections at all electrical joints.
- Use Teflon-based paste on pipe-style fittings. Optionally you can use Teflon tape but care must be taken not to wrap the tape too close to the end of the fitting to avoid the tape getting trapped in the solenoids or jets.
- Make sure your engine and related components (ignition, carburetor, and driveline) are in proper working condition. *Do not use any performance chip or modified computer that advances timing more than stock.*
- 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 DynoTune nitrous system only at wide-open throttle and at engine speeds above 4000 RPM.
- Use a high-quality fuel, as suggested in Chapter 3, Baseline Tuning Suggestions.
- Wear protective clothing and helmet while operating your vehicle. Make sure they are snell approved.

Don'ts

- Engage your nitrous system with the engine off. Severe engine damage can occur.
- Modify DynoTune nitrous systems (if you need a non-stock item, call DynoTune Technical Service for assistance).
- Over tighten AN type fittings.
- Use Teflon Tape on compression fittings.



- 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.
- Inhale nitrous oxide. Death due to suffocation can occur.
- Allow nitrous oxide to come in contact with skin. Severe frostbite can occur.

Chapter 1. Introduction to your DynoTune Nitrous Oxide Kit

1.1 General Information

This kit is intended for motorcycle/atv applications. The DynoTune kit was designed to work with all 4 stroke engines with Carburetor or EFI Injection. The installation of the kit requires prior knowledge of Nitrous systems installation. It's highly recommended that you have this kit professionally installed and tuned. DynoTune will not be held liable for faulty workmanship due to a faulty installation.

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. Your kit comes with the lowest and middle range hp jets only. Additional jets are available from DynoTune. Horsepower figures are at the crankshaft. **For EFI applications the fuel pump must have its own separate tap off the fuel tank, you cannot "T" into the high pressure EFI fuel line! You must tap a fitting into the gas tank. Optionally on race fuel systems you could use a fuel pressure regulator.**

1 CYL Jetting * Based on 5 PSI fuel pressure

Kits	Nitrous Jet / Fuel Jet*	Approximate Power Increase (BHP)
DynoTune Motor sport Kit	14/14	9 HP
	16/16	12 HP
	18/18	16 HP
	20/20	18 HP

2 CYL Jetting * Based on 5 PSI fuel pressure

Kits	Nitrous Jet / Fuel Jet*	Approximate Power Increase (BHP)
DynoTune Motor sport Kit	16/16	18 HP
	18/18	24 HP
	22/22	34 HP
	28/28	46 HP

3 CYL Jetting * Based on 5 PSI fuel pressure

Kits	Nitrous Jet / Fuel Jet*	Approximate Power Increase (BHP)
DynoTune Motor sport Kit	16/16	27 HP
	18/18	36 HP
	20/20	45 HP
	22/22	56 HP

4 CYL Jetting * Based on 5 PSI fuel pressure

Kits	Nitrous Jet / Fuel Jet*	Approximate Power Increase (BHP)
DynoTune Motor sport Kit	16/16	36 HP
	18/18	48 HP
	20/20	60 HP
	22/22	70 HP

1.2 System Requirements

When used correctly, this kit should work with stock internal engine components. To ensure proper performance and engine life, the following is an absolute must:

- ❑ If the bike is to be exposed to severe operating conditions, such as drag strip usage, the standard clutch should be replaced with a high performance unit.
- ❑ Forged pistons and a modified engine is required if higher horsepower levels are to be used. Consult your engine builder/Tuner to determine how much power your engine can safely use.
- ❑ Higher octane (100) should be used if your using this with an already modified engine, otherwise 92 octane should work fine for most lower compression engines. Do not use octane booster or alcohol fuels!
- ❑ The supplemental fuel pump provided with this kit must be used!
- ❑ **Your DynoTune Nitrous kit is capable of adding over 125HP! Professional advice must be obtained before running jets higher than the ones listed in the charts above!**

1.3 Kit Components

Before beginning the installation of your DynoTune nitrous kit, get familiar with the components in your kit with those shown in Figure 1 and listed in Table 2. ****NOTE: THE QTY IN THE CHART BELOW IS FOR THE 4CYL KIT. IF THE KIT YOU ORDERED HAS FEWER CYLINDERS THEN THE QTY'S WILL VARY.**

Table 2. DynoTune Direct Port Bike N2O Parts List

Item	Description	Quantity	P/N
1	N2O Bottle	1	
2	Bottle Bracket	1	
3	Siphon Tube Assembly	1	
4	4AN to 1/8"npt adaptor	1	
5	Wet Fogger Nozzle	4 **	
6	Wet Nozzle Adapter	4 **	
7	Wet Nozzle Adapter Nut	4 **	
8	Flare Jets	8 **	
9	Nitrous Solenoid (Blue or black wires)	1	
10	Fuel Solenoid (Red power wires)	1	
11	Solenoid brackets with 4 screws	2	
12	Tie Wraps	10	
13	3AN Braided lines (Red)	4 **	
14	3AN Braided lines (Blue)	4 **	
14 A	4AN Braided line (Blue)	1	
15	Distribution block (Red)	1 **	
16	Distribution block (Blue)	1 **	
17	1/8" NPT Plugs	0 **	
18	1/16" NPT Pipe Tap	1	
19	1/8" to 1/8" NPT male brass adaptor	2 **	
20	5/16" Hose Barb to 1/8"NPT	1	
21	5/16", 5/16", 5/16" "T" Hose Barb Fitting	1	
22	5/16" Hose Clamps	6	
23	3 feet rubber 5/16" fuel injection hose	1	
24	Fuel Filter	1	
25	Fuel Pump 4-6 PSI	1	
26	Throttle Micro Switch Assembly	1	
27	Non-Lighted Arming Switch	1	
28	Lighted Arming Switch	1	
29	Wiring Relay Harness	1	
30	Relay	1	
31	Fuse assembly	1	
32	Bag of Electrical crimps and Wire	1	

Figure 1. Typical Direct Port BIKE Kit Components (4 CYL kit shown)

If your kit is for 1-2-3 CYL engines it will not have all these parts. Example, the 2 CYL kit will have everything shown but only two sets of lines and two nozzles. The 1 CYL kits do not have the red and blue distribution blocks as the braided lines screw right into the solenoid outlet ports.



Chapter 2. Kit Installation

2.1 Bottle Mounting Instructions

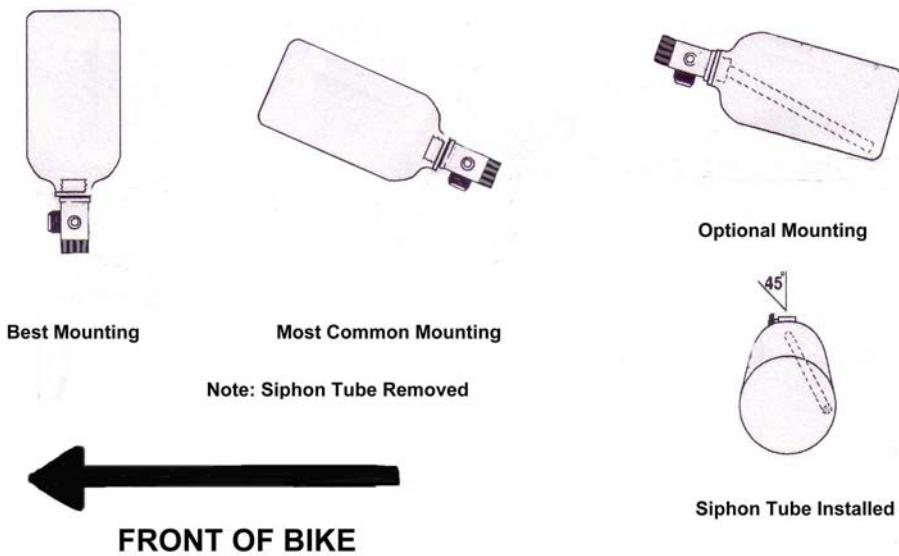
NOTE: Disconnect the battery ground before beginning installation.

2.1.1 Bikes

Accurate calibration of your DynoTune 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. If you mount it near the engine and the bottle pressure gets too high the solenoid may not open or you could run lean due to much nitrous being injected into the engine.

For Bottles without a siphon tube

Mount the bottle with the valve lower than the body of the bottle. The bottle does not contain a siphon tube so in order to get the liquid nitrous out of the bottle you need to keep the valve at the lowest point. Make sure the valve is also pointing to the back of the bike, as the liquid nitrous will be forced to the valve during hard acceleration! This will maximize the performance and use all the nitrous in the bottle.



For Bottles With a Siphon Tube (Optional upgrade)

Mount the bottle with the valve higher than the rest of the bottle. The siphon tube pickup location is at the bottom of the bottle and the same side as the valve outlet as shown. Best performance is achieved when the bottle is mounted at 45 degrees as shown. Do your best to keep this angle.

Optionally you can add the siphon tube and mount the bottle as shown above. Make sure the bottle is empty before removing the valve. Simply screw the tube onto the inlet of the bottle valve and bend the tubing toward the corner so that it will pickup the liquid nitrous under hard acceleration. Clean all debris from the bottle and valve and screw the valve back on and make sure it's tight and the o-ring is in good condition.

WARNING! DO NOT attempt to add 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.

2.0 Bottle Installation

After you have determined the location and orientation of the nitrous bottle, use the following procedure to install the bottle: Use the bracket provided to help secure the bottle. If the bracket does not fit or is causing mounting issues then you need to customize the installation. Just make sure the bottle is securely mounted and cannot cause a dangerous condition.

2.1 Solenoid mounting

Use the following procedures to install the nitrous and fuel solenoid. Remember, always use Teflon paste on the pipe threads.

- Hint: placement of the solenoids is often limited by the lack of possible mounting locations around the engine. Try your best to follow these installation requirements.
- Keep the solenoids and lines away from the exhaust.
- Keep the solenoids mounted above the fogger nozzles.
- Trial fit the solenoids with all the lines attached to make sure they all fit.
- Solenoids can be mounted sideways or upside-down if needed.
- Note: Fuel solenoids have red wires!
- Note: Nitrous solenoids have Blue or Black wire
- You can bend the solenoid mounting brackets if you need to!

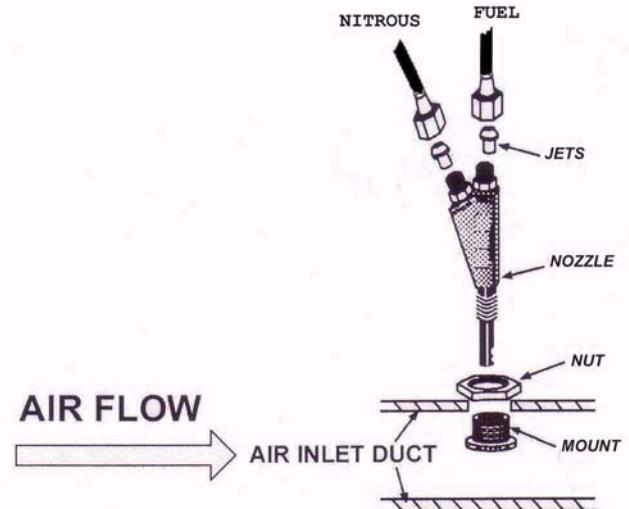
2.2 Solenoid Installation 2-3-4 CYL kits

1. Clamp the nitrous solenoid (solenoid with blue or black wires) in a bench vise.
2. Install one of the blue nitrous lines into the “inlet” of the nitrous solenoid. Don’t forget to use Teflon paste on all pipe threads only. Screw the 1/8” NPT to 1/8” NPT brass adaptor into the “outlet” port of the nitrous solenoid. Screw this assembly to the blue distribution block inlet.
3. Clamp the fuel solenoid (solenoid with red wires) in a bench vise. Install the fuel filter into the “inlet” of the fuel solenoid. Don’t forget to use Teflon paste on all pipe threads only. Screw the 1/8” NPT to 1/8” NPT brass adaptor into the “outlet” port of the fuel solenoid. Screw this assembly to the red distribution block inlet.
4. Secure both solenoids to their mounting brackets with the provided screws.

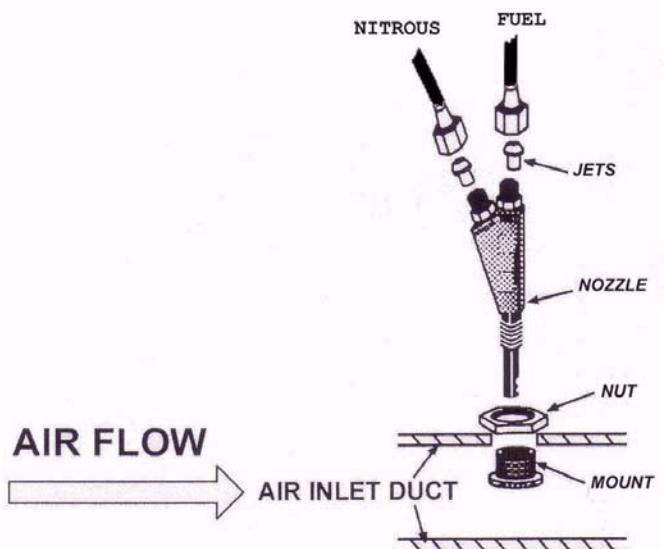
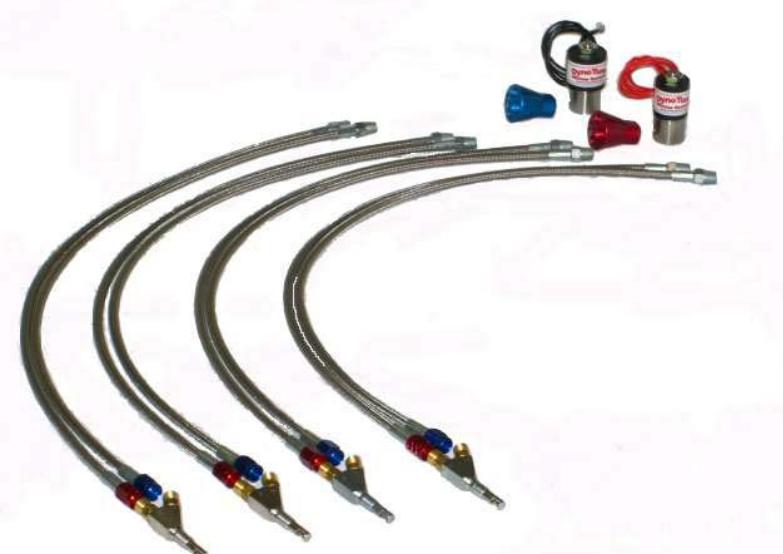
Solenoid Installation 1 CYL kit

5. Clamp the nitrous solenoid (solenoid with blue or black wires) in a bench vise.
6. Install one of the blue nitrous lines into the “inlet” of the nitrous solenoid. Don’t forget to use Teflon paste on all pipe threads only. Screw the other blue nitrous line into the “outlet” port of the nitrous solenoid.
7. Clamp the fuel solenoid (solenoid with red wires) in a bench vise. Install the fuel filter into the “inlet” of the fuel solenoid. Don’t forget to use Teflon paste on all pipe threads only. Screw the red braided line into the “outlet” port of the fuel solenoid.
8. Secure both solenoids to their mounting brackets with the provided screws.

2.3 Nozzle Installation:



1. The nozzles should be mounted between the engine and the Carburetors. It is always best to mount the nozzles on top or the sides of the intake track, only mount on the bottom as the last option. Always make sure the solenoids are above the nozzles in all cases! Mark the drill locations and remove the intake.
2. If you will be mounting the nozzles into rubber you will need to use the Blue nozzle mounts provided. See picture below for Nozzle mount installation.
3. Drill a $\frac{1}{4}$ " dia. Hole in the desired location if using the nozzle mounts. If mounting into metal drill a hole for $1/16$ " NPT threads. Make sure the holes are lined up so it looks nice.
4. Note: If you tapping into metal you need to make sure and tap all the holes to the same depth.
5. Remove chips and or rubber from inside intake.
6. Secure the nozzles into the intake using Teflon paste. If mounting the nozzles in rubber or plastic you need to use the nozzle mounts! Secure the nozzle mount as shown above. Use paste on the nozzles.
7. Make sure the discharge of the nozzle is pointing toward the engine only and toward the target Cylinder.



2-3-4 CYL kits

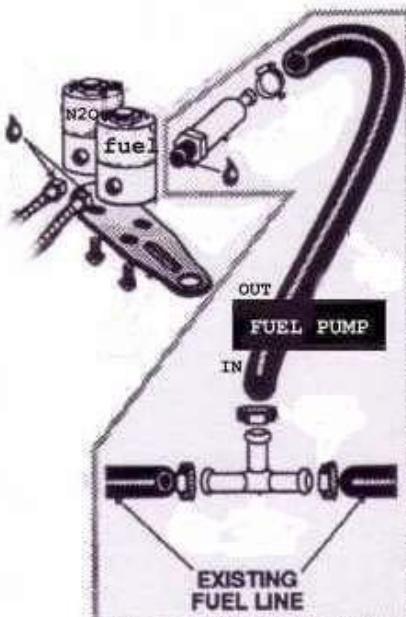
8. Screw all the lines into the distribution blocks. Keep the blue lines going to the blue block and the red lines going to the red block. This will allow you to test fit the lines and help determine the best solenoid mounting to make sure all the lines are long enough. If you do not have a 4 CYL engine you must plug the empty distribution block ports with the 1/8" NPT plugs provided. Make sure and use Teflon paste to seal all the joints.
9. Insert the jets you want into the nozzle(s) and attach the nitrous lines to their corresponding locations in the nozzle. (Blue for nitrous (N) Red for fuel (F)) as seen in the drawing above. Do not over tighten the lines to the nozzles.

1 CYL kit

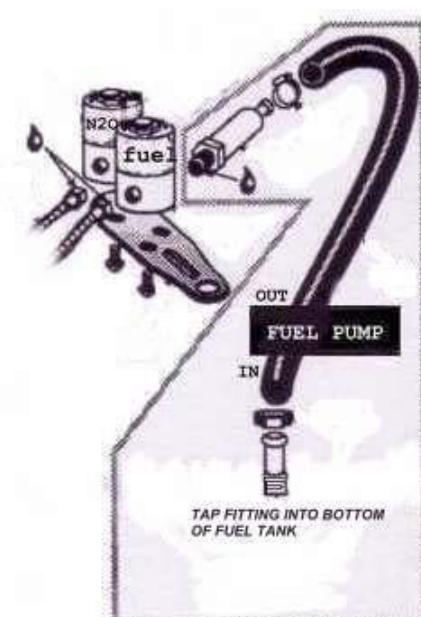
10. Insert the jets you want into the nozzle and attach the nitrous lines to their corresponding locations in the nozzle. (Blue for nitrous (N) Red for fuel (F)) as seen in the drawing above. Do not over tighten the lines to the nozzles.

2.5 Fuel Pump Hookup:

1. Mount the fuel pump in a cool location away from the exhaust of moving parts! You need to tap into the existing fuel line or gas tank on your bike. Use the provided lines and fittings as needed to complete the installation.



CARBURATOR APPLICATIONS



EFI FUEL INJECTION APPLICATIONS

2. Note: if you are using horse power setting higher than the jets provided with this kit its recommended that you use a high flow petcock valve, not the factory valve as this can cause a lean condition.
3. Note: Be careful when working with fuel as it is extremely flammable and sparks can cause fires!
4. Wiring of the pump will be covered in the upcoming section.
5. Hook all the fuel lines as shown. Note: Kits always best to keep the fuel lines as short as possible.
6. Make sure and use the Fuel filter goes into the inlet of the fuel solenoid.
7. **NOTE: For EFI applications the fuel pump must have its own separate tap off the fuel tank, you cannot "T" into the high pressure EFI fuel line! You must tap a fitting into the gas tank. Optionally on race fuel systems you could use a fuel pressure regulator set at 5PSI.**

2.6 Final Inspection

1. Hook up the blue line from the bottle to the Nitrous solenoid if you have not yet done.
2. Finish up with all the lines and hoses, fittings etc and double check. Make sure and keep dirt from entering any hoses or lines.
3. Before you proceed to wiring, start the bike and check for fuel leaks. Danger, Gas fumes are flammable and can ignite in a confined location, always work in a well-ventilated area.
4. Make sure your nitrous bottle is full. Open the valve and check for leaks and repair as needed.

2.7 Electrical System Installation

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

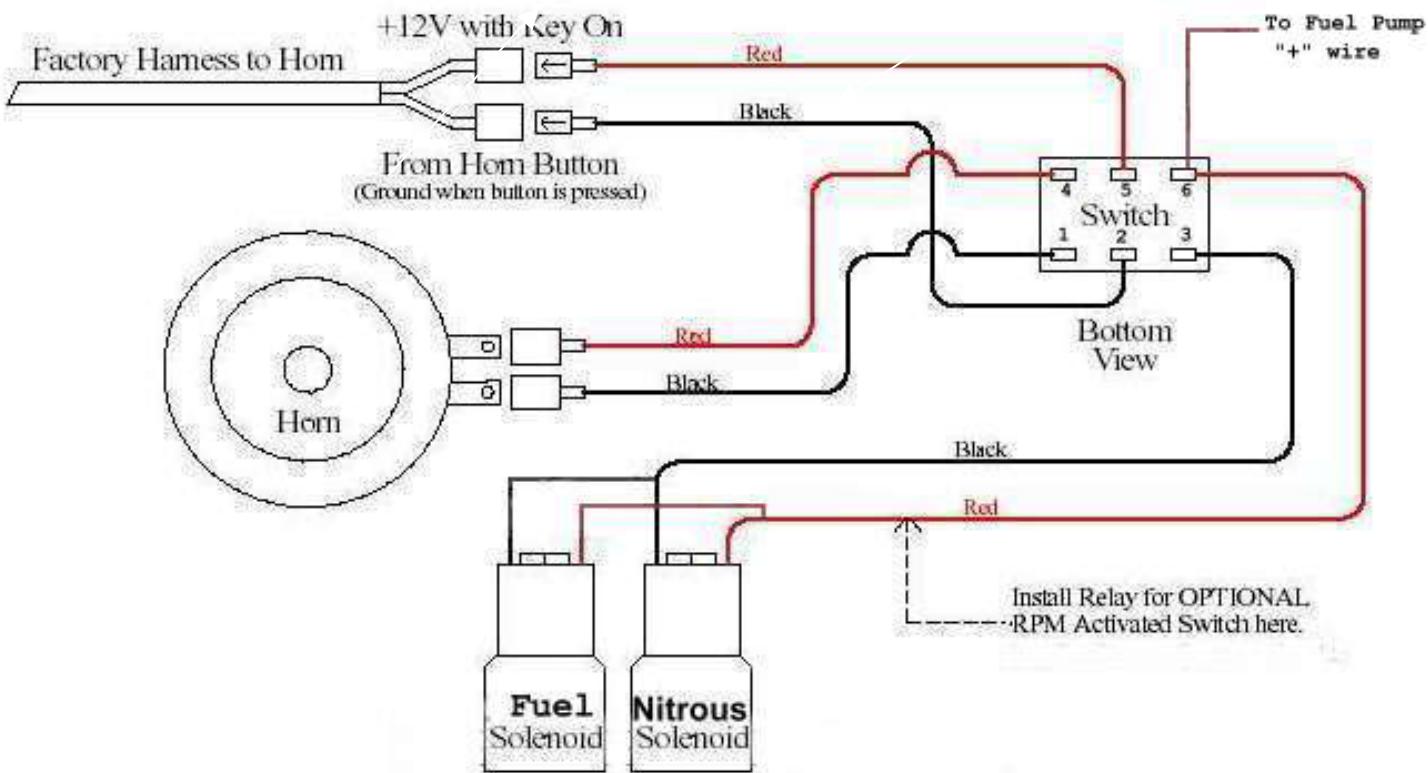
Disconnect the battery at the ground cable (if not already done.)

Your factory horn or starter switch must be used to trigger the nitrous system. The Switch is for arming the system. Use the diagrams below to help assist you with the installation.

Note: consult the factory shop manual for proper wiring if it is not covered in the following diagrams. Due to the many wiring diagrams only a few common diagrams are provided.

Some models provide +12v when the horn is activated. When using wiring diagram #2 the solenoid wire polarity will need to be reversed if the horn button provides +12v.

Wiring Diagram #1



Note: Both Nitrous and Fuel solenoids are wired together so they get power at the same time. There is no polarity to the solenoid power wires.

Fuel Pump Wiring: If using the wiring diagram #1 hook the fuel pump + wire (RED) to pin 6 on the arming switch. Hook the other fuel pump wire to ground. When the arming switch is "on" the fuel pump will turn on. Always verify fuel pump operation prior to using your nitrous system.

Factory Horn switch wire colors

Hayabusa & GSXR1000 = Solid black

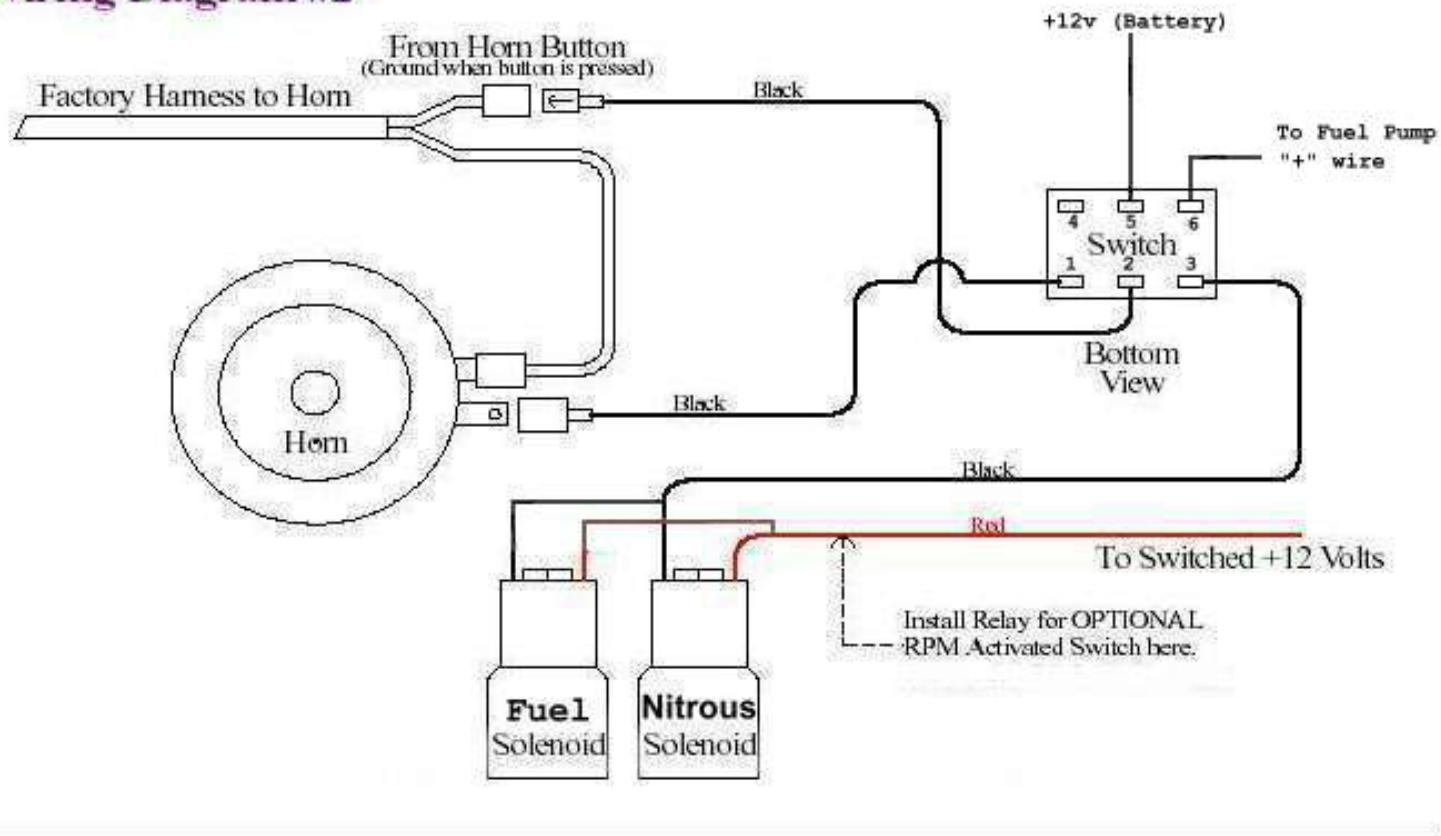
ZX12R = Black with white tracer

Factory starter switch wire colors

Hayabusa & GSXR1000 = Yellow with Green tracer

ZX12R = Blue with white tracer

Wiring Diagram #2

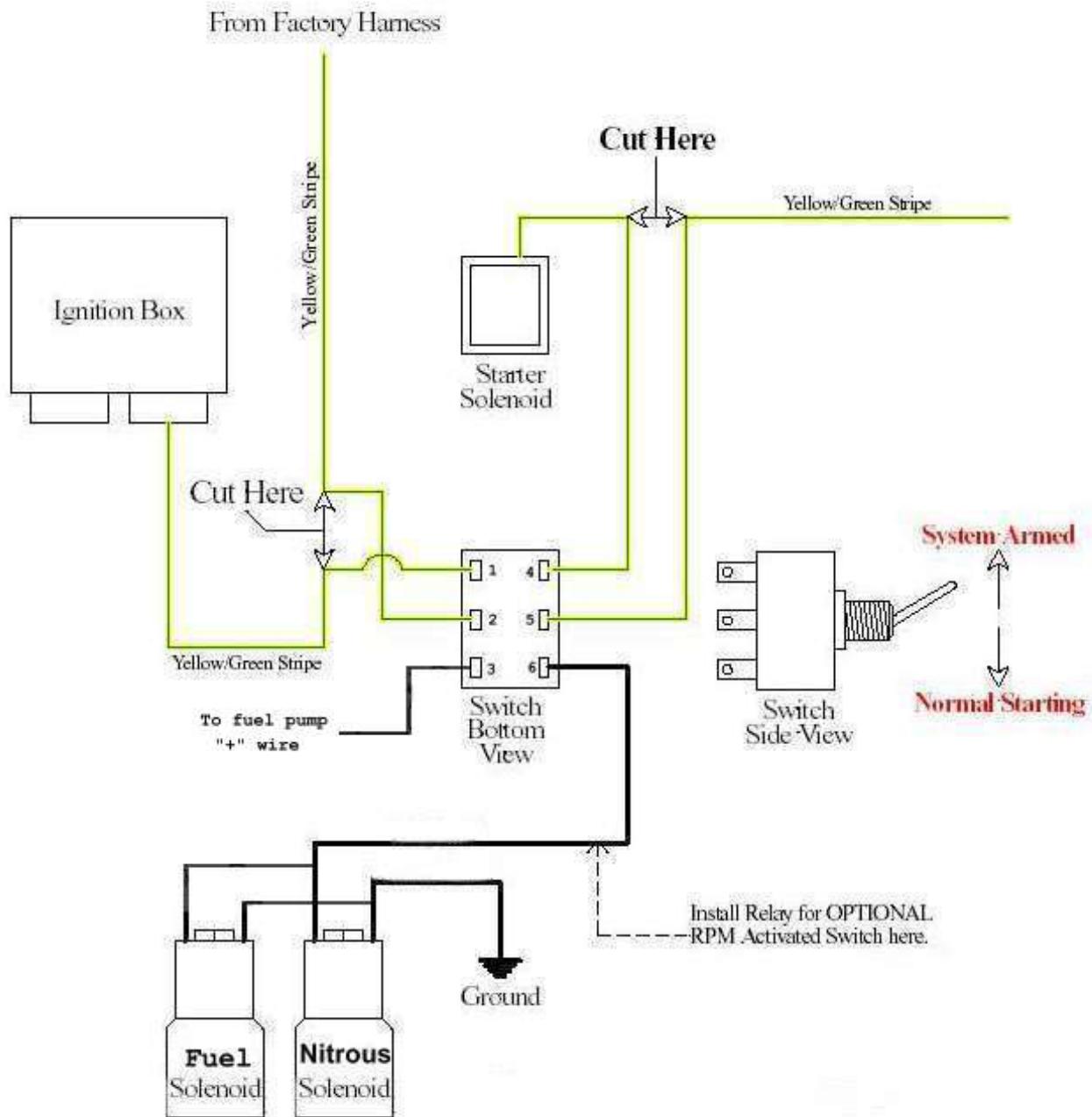


Note: Both Nitrous and Fuel solenoids are wired together so they get power at the same time. There is no polarity to the solenoid power wires.

Fuel Pump Wiring: If using the wiring diagram #2 hook the fuel pump + wire (RED) to pin 6 on the arming switch. Hook pin #5 on the arming switch to the battery +12V. Hook the other fuel pump wire to ground. When the arming switch is "on" the fuel pump will turn on. Always verify fuel pump operation prior to using your nitrous system.

NOTE: Nitrous flowing through the solenoid is needed to keep the coil from melting. Short, one or two second power cycles will not hurt them but more than 5 seconds with no nitrous flowing though it will melt the coil and void your warranty.

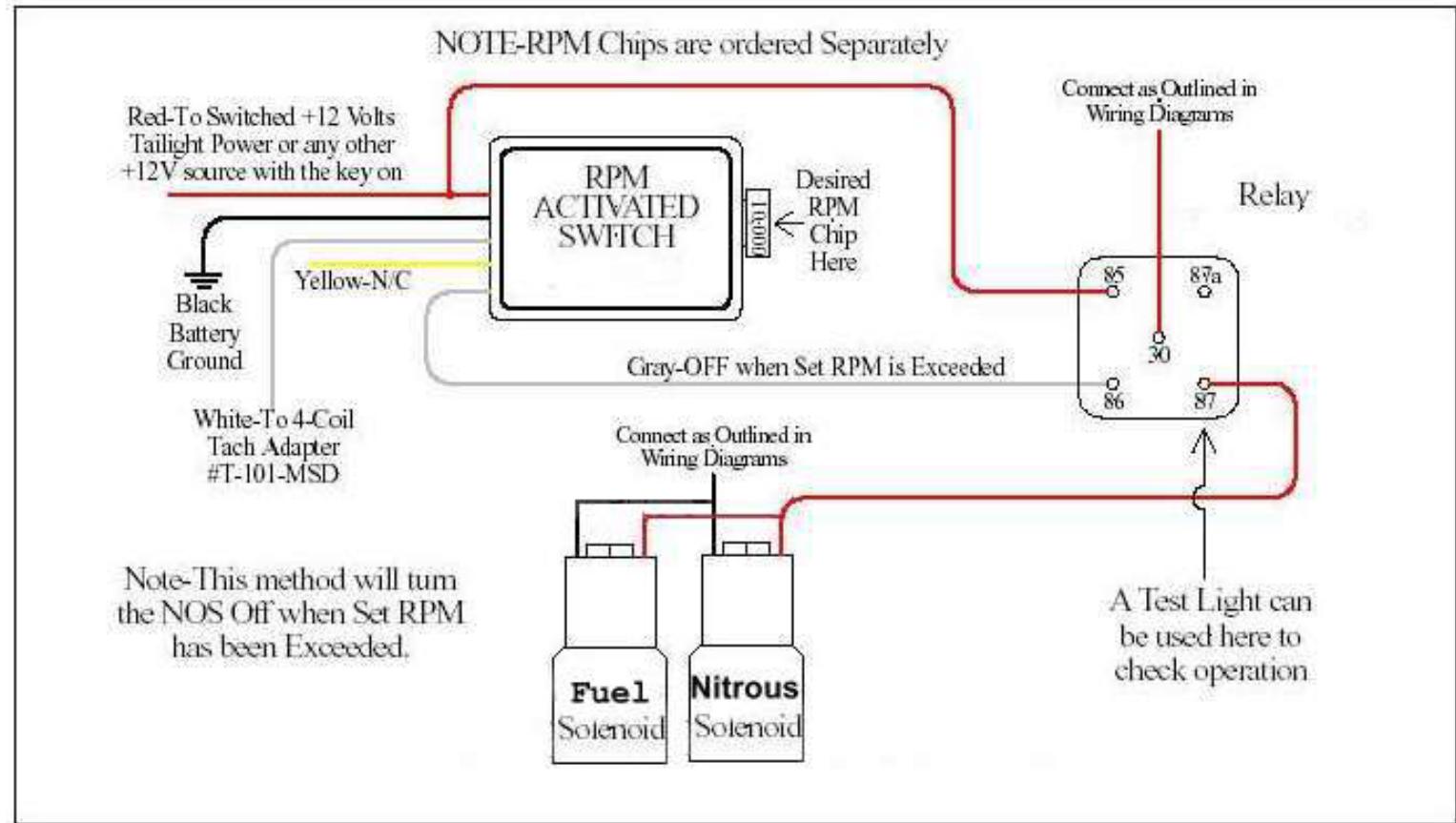
Wiring Diagram #3, Starter Button Activation for Suzuki Hayabusa



Note: Both Nitrous and Fuel solenoids are wired together so they get power at the same time. There is no polarity to the solenoid power wires.

Fuel Pump Wiring: If using the wiring diagram #3 hook the fuel pump + wire (RED) to pin 3 on the arming switch. When the arming switch is "on" the fuel pump will turn on.

Note: This is a suggested wiring application. There are many different ways that an optional RMP switch can be installed. The installer needs to set the RPM switch to the proper RPM and test the operation. Use wire diagrams 1&2 for relay terminal #30 connection.



Note: Both Nitrous and Fuel solenoids are wired together so they get power at the same time. There is no polarity to the solenoid power wires.

NOTE: Nitrous flowing through the solenoid is needed to keep the coil from melting. Short, one or two second power cycles will not hurt them but more than 5 seconds with no nitrous flowing though it will melt the coil and void your warranty.

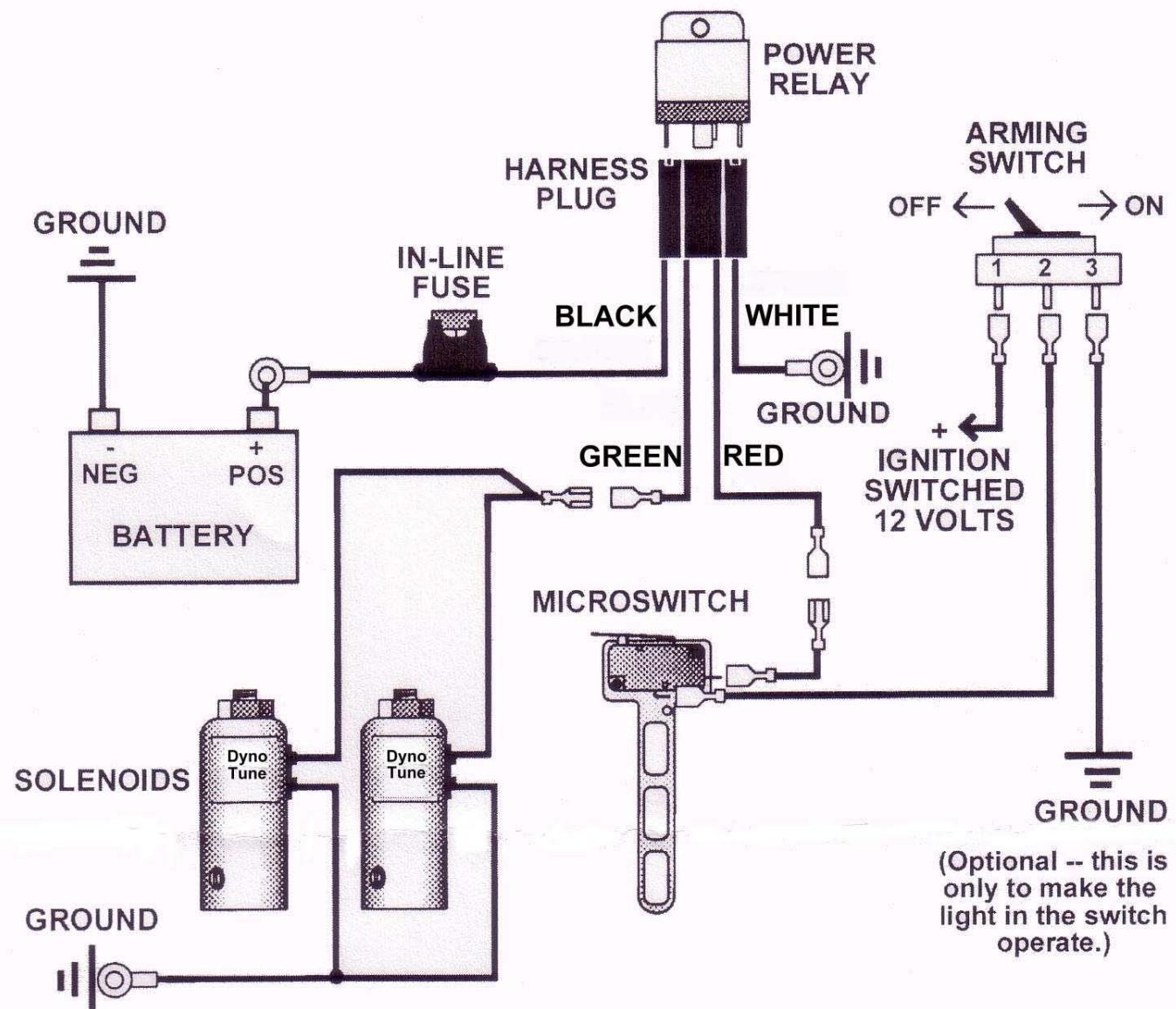
Alternately you can use the included throttle mounted micro-switch.

Mount the switch so it will only trip at wide-open throttle. Make sure it does not interfere with the operation of your bike or sticking during use.

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

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

The wiring below is optional but all the parts are also supplied to wire your system up as shown below.



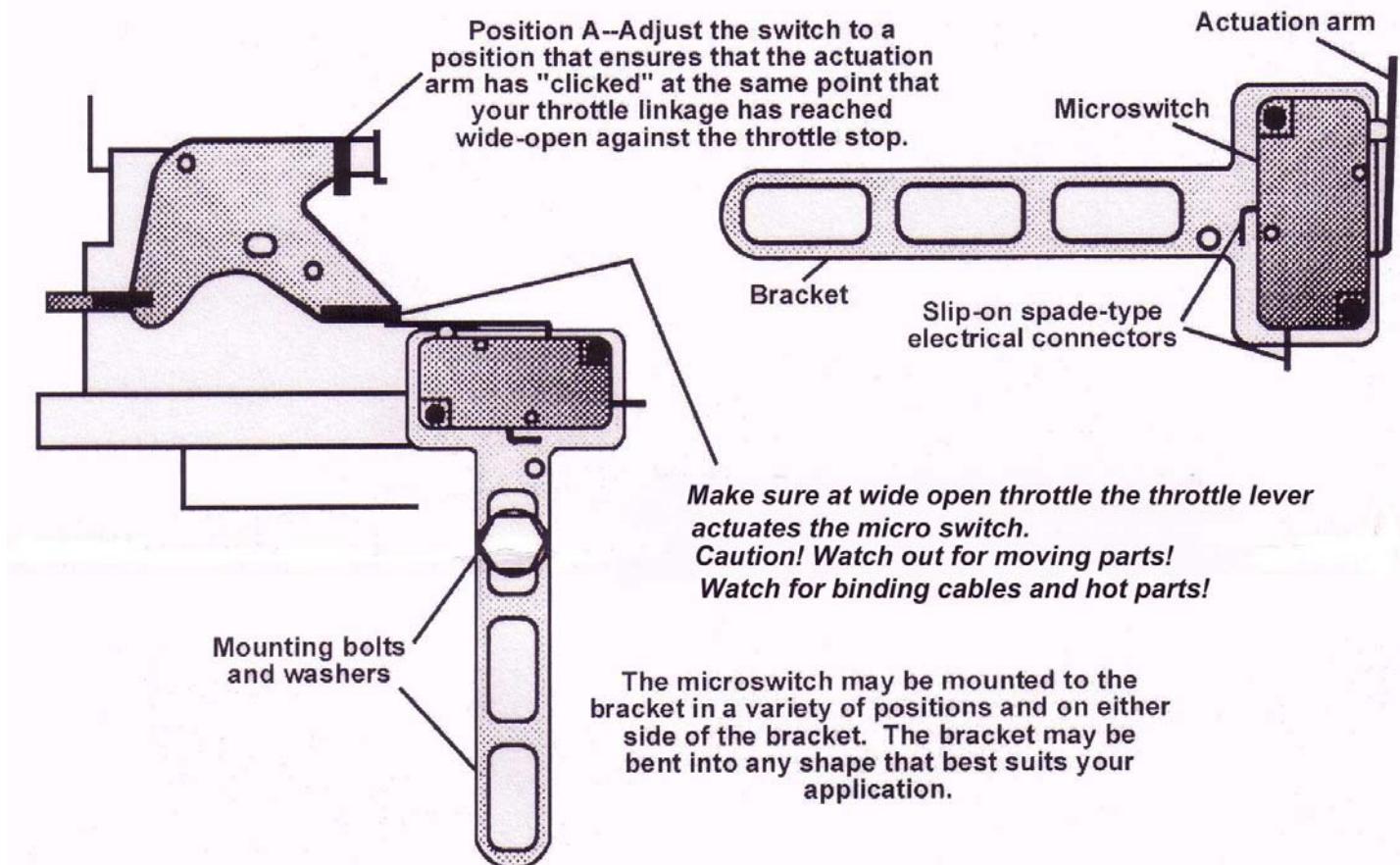
Fuel Pump Wiring

- 1) Wire the fuel pump's Plus wire (RED) to the #2 terminal on the "Arming switch"
- 2) Wire the fuel pump's other wire (Ground) to a solid ground.

NOTE: Blue wire on relay not used

Mounting the wide open throttle switch (For use with above wiring)

- 1) Make sure none of the wires or switch components make the throttle bind or stick! Make sure the WOT switch actuates at Wide-open throttle only!
- 2) Note: Custom fabrication may be needed to mount the switch properly. Alternately you can use the horn or starter button to activate the nitrous system.
- 3) Note: It does not matter what terminal is used for the 12V or ground on the switch.



Chapter 3 Baseline tuning suggestions

Start with the smallest jets. Try it in a controlled situation like on a Dyno first then on the track. Use stock timing while using the nitrous. Advancing the timing while using nitrous can lead to detonation and serious engine damage. Use the highest octane you can find, minimum 91 octane. Do not allow the engine to hit the rev limited while on nitrous. An rpm activated switch is great for this.

Chapter 4 Preparing for operation

Warning: Always wear proper safety gear while racing your bike. This includes, Snell 95 or newer helmet, leather jacket, leather pants, gloves and boots that cover your ankles.

- 1) Hook your battery back up.
- 2) Open the nitrous bottle valve.
- 3) Inspect all the lines and fittings for leaks and adjust as needed.
- 4) Never use the nitrous in first gear as wheel spin or a wheelie may result.
- 5) Surging while using the nitrous is due to: 1) Nitrous in bottle is low or almost Empty. 2) The nitrous is not consistently coming out of the bottle due to a poor mounting method.
- 6) Check to make sure you have fuel pressure for the nitrous fuel pump when the system is armed. You should hear it making noise when the pump is running.
- 7) Enjoy the power only a DynoTune Nitrous system can offer!

Chapter 5 Advanced Tuning for Maximum power

After performing the Baseline Tuning Suggestion-Chapter 3, if you desire to maximize the performance of your system a professional tuning session on a Dyno will be required. Check your plugs to make sure your running safe. Use a wideband air/fuel Gauge on the Dyno. You will need to retard timing as needed!

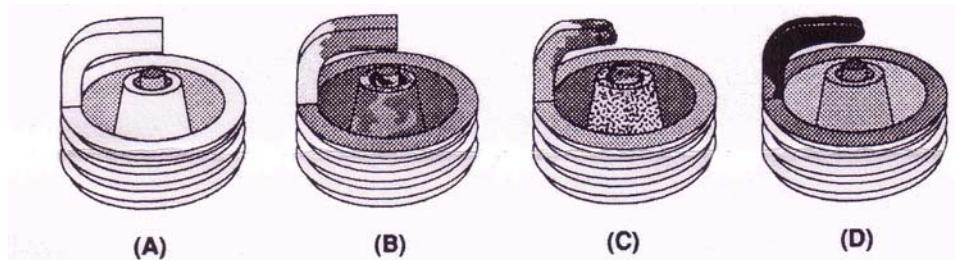


FIG. 11

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, the 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 be burnt 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 in color, or the entire ground start can become discolored.

Chapter 6 Routine Maintenance

6.1 Nitrous filters and lines

- 1) Clean the Filter in the nitrous solenoid inlet port if so equipped.
- 2) Inspect all tubing for leaks and repair as needed.

6.2 Nitrous Solenoid Plunger

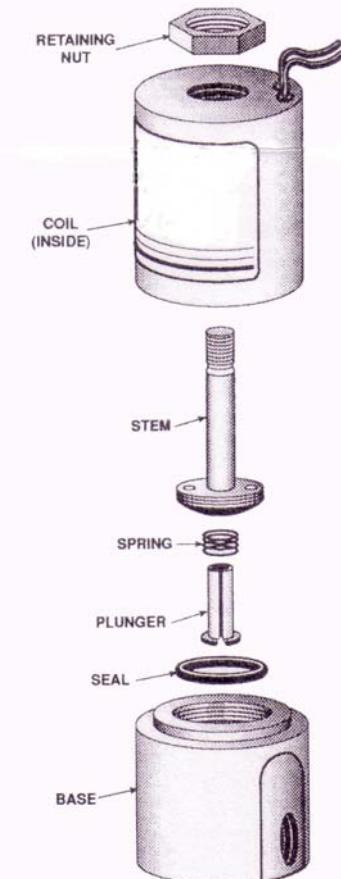
6.2.1 General information

The seals used in DynoTune nitrous oxide solenoids are designed to be used with nitrous oxide only. When kept from fuel contamination or over pressurization, do not run alcohol fuels or additives as this will destroy the fuel solenoid seals, they should provide trouble free performance if you follow these rules. You should periodically (after every 20-30 pounds of nitrous usage) examine the seal in the Nitrous and fuel solenoid plungers. The seals used in the plungers are designed to work at pressures up to 1100psi. Exposing the plunger to excessive pressure can result in the seal in the plunger swelling or in extreme cases, the plunger seal disintegration resulting in a leaky solenoid.

NOTE: The swelling of the nitrous solenoid plunger seal will reduce nitrous flow and a loss of power).

6.1.1 Nitrous Solenoid plunger Disassembly and inspection

- 1) Close the valve on the nitrous bottle.
- 2) Empty the main nitrous supply line.
- 3) Remove the main nitrous supply line.
- 4) Remove the retaining nut form the nitrous solenoid and remove the coil and housing. Note any shims.
- 5) Unscrew the stem from the nitrous solenoid base. Do this by double nutting the stem; do not use pliers as this will damage the stem!
- 6) Remove the stem, spring and plunger from the solenoid base.
- 7) Examine the plunger seat 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 in the fresh air over several days. A seal, which is flat, but protrudes from the plunger body has probably failed internally and should be replaced.
- 8) Re-assemble in reverse order.



Troubleshooting Chart

PROBLEM	POSSIBLE CAUSES	DIAGNOSTIC PROCEDURE	CORECTIVE ACTION
No change in engine speed when the fuel solenoid is activated (prepairing for operation–chapter 4)	System wired incorrectly	Compare wiring to Wiring fig 9.	Wire per instructions.
	Restricted fuel line.	Inspect fuel line for restrictions (crimped or plugged).	Remove restriction
	Fuel pump mounting	Make sure the fuel pump is lower than the gas tank outlet	Re-mount the fuel pump so its lower than the gas tank outlet
	malfunctioning fuel solenoid.	Turn arming switch on. Cycle the microswitch. Solenoid should make a "clicking" noise.	repair/replace solenoid
Change in engine speed when nitrous bottle valve is opened	Malfunctioning nitrous solenoid	Remove and inspect solenoid	repair/replace solenoid
Engine runs rich when system is activated	Bottle valve not fully opened	Check bottle valve	Open valve Fully
	Bottle mounted improperly	Check bottle orientation	mount bottle properly
	Plugged nitrous filter	Inspect filter	Clean/Replace filter
	Low bottle pressure	Check bottle temp/pressure	Set bottle temp to 75-85 F or 950 PS pressure
	Inadequate nitrous supply	Weigh bottle	Fill bottle
	Mismatched nitrous.fuel jetting	compare jets to recommended jets	install correct jets
	Excessive fuel pressure	Install a fuel pressure gauge, measure pressure during acelleration with system activated	Regulate pressure down or install a smaller fuel jet
	Loose nitrous solenoid wiring	Inspect nitrous solenoid wiring	Repair wiring.
	Malfunctioning nitrous solenoid	Close the bottle valve. Disconnect the nitrous solenoid (+) lead. Open the nitrous bottle valve. Connect +12v to the solenoid lead. Nitrous should discharge at high rate.	Rebuild solenoid
	System wired incorrectly	Compare wiring to schematic in figure 9	Wire system per instructions
No change in performance when system is activated.	Loose ground wire(s)	Connect 12v test light to the battery (+) terminal. Check for continuity at grounds noted in figure 9	Tighten/Repair loose grounds
	Malfunctioning arming siwtch	Turn arming siwtch 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 mircoswitch if equiped	Temporarily disconnect power relay red wire from microswitch. Connect 12V test light from battery (-) terminal. Manually set microswitch ON. Check for continuity at microswitch positive temrial (fig 9)	Replace throttle microswitch
	Overly rich fuel condition	Check for black smoke or backfiring thorugh the exhaust with system activated.	Install smaller fuel jet or decrease fuel pressure
	Excessive ignition timing	Check ignition timing	Reduce timing in 2 degree increamnets.
Engine detonates mildly when system is activated	Inadequate octane fuel		Use higher octane fuel
	Spark plug heat range to high.		Reduce spark plug heat range (maximum 2 steps)
	Fuel pump flow	Check fuel pressure at WOT is 5PSI	replace with new pump if pressure is low
	Too much nitrous flow	Check bottle pressure as it may be to high	Reduce nitrous jetting

Troubleshooting Chart Continued

PROBLEM	POSSIBLE CAUSES	DIAGNOSTIC PROCEDURE	CORRECTIVE ACTION
Engine detonates heavily when system is activated	Inadequate fuel delivery due to: Plugged fuel filter	Inspect filer	Clean or replace filter
	Crimped fuel line	Inspect fuel line	Replace crimped line
	Weak fuel pump	Replace fuel pump with high performance version	Repair/Replace fuel pump
High-RPM misfire when system is activated.	Excessive spark plug gap	Inspect spark plugs	Set spark plug gap at .030" to .035"
	Weak Ignition/Ignition component failure	Inspect components (Plug wires, distributor cap, etc.)	Replace worn parts.
Surges under acceleration when system is activated.	Inadequate supply of nitrous	Check bottle weight	Fill bottle
	Bottle mounted incorrectly	orientation to instructions (figures 2&3)	Mount Bottle in correct orientation