



# INSTRUCTIONS

## #82044 Race Diesel Nitrous System

Thank you for choosing ZEX™ products; we are proud to be your manufacturer of choice. Please read this instruction sheet carefully before beginning installation, and also take a moment to review the included limited warranty information.



### Kit Parts List

Description	Qty.	Description	Qty.
Nitrous Solenoid	2	.088 N20/Fuel Jet	2
Nitrous Solenoid Filter Fitting	2	.125 N20/Fuel Jet	2
24" Hose, -4AN, Purple, w/ -3AN end	2	Arming Switch	1
16' Hose, -4AN, Purple	2	Arming Switch Cover	1
Dry Nitrous Nozzle	2	Push-Button	1
Bulkhead Fitting and Nut	2	30 AMP Fuse	2
10lb Nitrous Bottle w/ Valve	2	Electronic TPS Throttle Activation Switch	1
Bottle Bracket (Short)	2	Adjustable Boost Switch	1
Bottle Bracket (Long)	2	20 AMP Mini-Relay	2
Solenoid Bracket	2	5/16 – 18 x 1" Bolt for Bottle Brackets	8
.032 N20/Fuel Jet	2	5/16 – 18 Nut for Bottle Brackets	8
.046 N20/Fuel Jet	2	5/16 Flat Washer	8
.062 N20/Fuel Jet	2	10-32 Solenoid Bracket Screws	4
.074 N20/Fuel Jet	2	1/16-27 NPT Tap	1

## **Why Our Nitrous System Is Better:**

The installation of a ZEX™ Race Diesel Nitrous System adds awesome, race winning power to your vehicle. It is designed as a two stage system, so you can launch with a smaller shot to keep from spinning your tires, but once everything is hooked up, you can hit the second stage for another huge horsepower boost. The Race Diesel Nitrous System offers additional power gains when used in tandem with propane injection and advanced power programmers that add large amounts of supplemental fuel. By more thoroughly burning the increased volume of diesel fuel entering the engine, the ZEX™ Race Diesel Nitrous System increases power, reduces exhaust gas temperatures, cools the inlet air charge and drops your quarter mile times like nothing else can.

## **Quick Start Reference Guide:**

**How the ZEX™ Diesel Nitrous System works:** The ZEX™ Part #82044 Race Diesel Nitrous System begins with connections to two 10 lb. supply cylinders containing pressurized liquid nitrous oxide. These connections then go to the system's nitrous solenoids. These solenoids are normally closed but are opened when the nitrous system is armed, boost pressure is above the kit's set pressure and the TPS throttle switch is activated by going to wide-open throttle. Once the first solenoid opens, the nitrous is delivered to the engine via a braided stainless steel delivery line that is connected to a nitrous nozzle. Once the system's push-button is depressed, the second solenoid opens and feeds additional nitrous to the engine via another braided stainless steel delivery line and nozzle. The amount of nitrous that is injected is adjustable by means of a metering jet installed in each nitrous nozzle. These metering jets allow for easy changes in horsepower settings.

**Work safely.** Always wear eye protection and gloves when working with lines or hoses that contain pressurized nitrous oxide. Never transport nitrous cylinders loose in a trunk or loose in the back of a pick-up truck and especially NOT within a vehicle's interior whether the cylinder is full OR empty. Always disconnect the GROUND side of the battery when working on any electrical components.

**Nitrous oxide won't fix problems you already have.** Before you install your nitrous system, be sure your engine is in good mechanical condition. Intermittent wiring problems, etc., can lead to erratic system performance and possible engine damage.

**Never defeat operation of the safety relief disc in the nitrous cylinder's valve.** It's required by law and is there for your safety. Never drill, machine, weld, deform, scratch, drop or modify a nitrous oxide tank in ANY way whatsoever!

**Never overfill nitrous cylinders.** That little bit extra will put you and others at risk of injury. More often than not, when the cylinder warms up, the pressure goes above the limit of the safety relief disc and you lose all the nitrous you just paid for.

**All the power comes from the fuel, not the nitrous.** Nitrous oxide is simply a tool that allows you to adjust how much and how quickly the engine burns the fuel. If the fuel isn't there, the power won't be either.

**When system is activated, if something doesn't feel or sound right, BACK OFF:** If you hear any excessive pinging or feel anything unusual, get off the throttle. It's a lot easier to check everything over than it is to just try to drive through it and damage expensive parts.

**Clear nitrous lines after use.** Close the bottle valve and use a purge kit to relieve the residual nitrous line pressure, or open one of the line's fittings to let the pressure bleed off.

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Part #ZEX176  
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**Do not use Teflon sealing tape on any fittings in a ZEX™ nitrous system.** It is easy for Teflon tape to get pulled into the system, causing blockages that can ultimately lead to incorrect nitrous system performance. Only use liquid thread sealer for all NPT type fittings. Do not use any thread sealing compound on AN style threads.

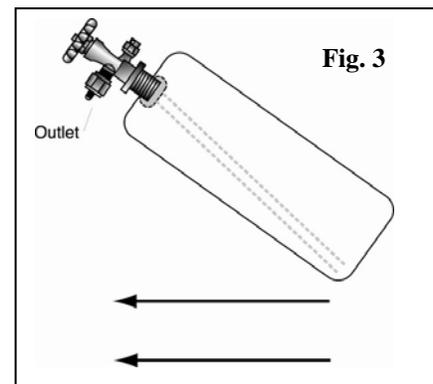
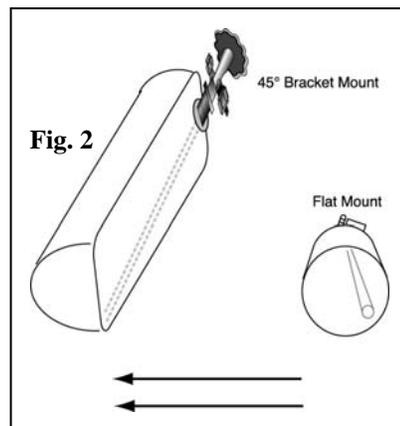
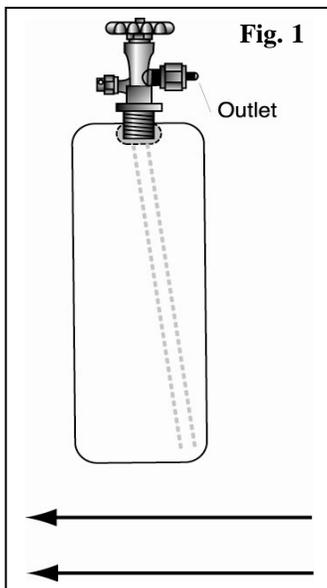
**When finished using your nitrous system, close the nitrous bottle valve and relieve the line pressure.** This eliminates the possibility that nitrous could inadvertently accumulate in the intake manifold while the nitrous system is not being used.

**Do not run excessive bottle pressures.** Excessive bottle pressures, over 1100psi, will not improve system performance. Your ZEX™ nitrous system is calibrated and optimized to operate from 900-1000psi. Over 1100psi also runs the danger of locking the nitrous solenoids closed due to excessive pressure working against the valve plungers. If this happens, you must cool the nitrous bottles down to lower the pressure. This will allow the valves to operate properly again.

**How to adjust power levels.** The ZEX™ Race Diesel Nitrous System is designed for multiple power levels. A metering jet installed in each nitrous nozzle controls these power levels. To change the power output, all you need to do is install the appropriate jet. The correct jet for a given power level is listed on the jet chart at the end of this instruction manual.

## **Installation Instructions:**

- 1. Decide where to put everything.** Before you start to install the various components of this kit, you'll have to locate the best locations of each component by trial fitment and careful measurement. First, decide where you want to mount the nitrous solenoids. Remember, the stainless steel braided lines that connect these to the nozzles are 24 inches long. Observe and mark the locations on the air inlet or charge pipe tubing where you want to drill and tap for the nitrous nozzles or bulkhead fittings. You'll also have to decide where to install the arming switch and the nitrous bottles. The arming switch should be installed in a position convenient to the driver but not in an area where it could be accidentally armed. To help you decide where and how you'll mount the nitrous supply bottles, check Fig. 1, 2, and 3 for technical restrictions on bottle mounting locations and positions. Finally, have a reputable performance shop fill your nitrous bottles with automotive grade nitrous oxide before you begin. Do not overfill the nitrous bottles.



## 2. Mount nitrous supply bottles.

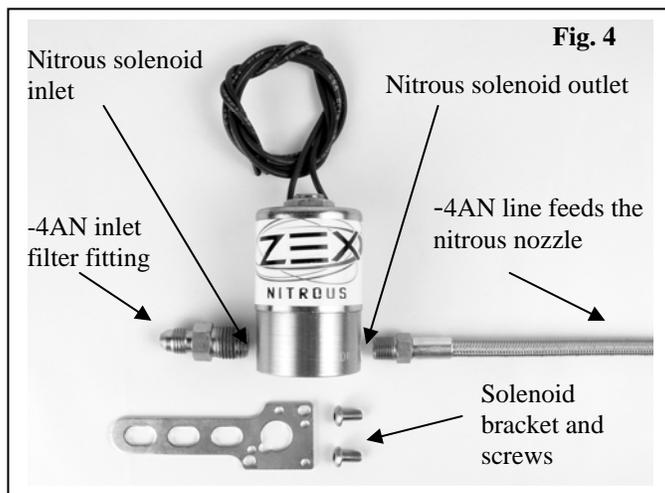
- A. Mount the nitrous supply bottles. If they are located inside the passenger cabin, it is recommended that a pair of safety blowdown tubes (ZEX™ Part #82099) be installed. Route the tubes from the safety pressure relief cap to the exterior of the vehicle, preferably underneath. Doing so will prevent your vehicle from filling with a cloud of nitrous oxide should one of the safety pressure relief caps rupture.
- B. Index the pickup tube with bottle position. (Refer to Fig. 1, 2, and 3). ZEX™ nitrous bottles are designed with the bottom of the siphon tube at the bottom of the bottle towards the outlet. Always mount the bottle so that as your vehicle accelerates, the liquid flows toward the pickup tube.

## 3. Mount nitrous delivery lines under the vehicle.

When routing the nitrous delivery lines under the vehicle, try to use the frame as a conduit. This protects the line and eliminates the need to use clamps. The supplied cable ties work if you can run the line higher in the under-body so that it's safe from road level obstacles. For the pro-race look, you can use steel loom clamps with rubber sheathing to fasten the line to the body.

## 4. Mount nitrous solenoid.

Keeping in mind the length restrictions of the nitrous nozzle feed lines and nitrous delivery lines, mount the nitrous solenoids in the engine bay using the supplied brackets and screws (Fig. 4).



## 5. Install nitrous nozzles.

- A. Optimum nozzle placement on diesel engines is 12-24 inches away from the entry to the engine's intake manifold, but anywhere in the inlet track of the engine has been proven safe and effective. After you have determined where to install the nitrous nozzles, mark the charge pipe, then remove it from the vehicle. Make sure these locations won't interfere with other components in the engine bay.
- B. If the charge pipe is metal, you can drill the pipe with a 1/4" drill bit, then tap the hole with the included 1/16 NPT thread tap. If the charge pipe is rubber, you can drill a 7/16" hole and install the bulkhead fitting instead. If using the tap, take special care to not tap the hole too deep. It is recommended to tap a few turns at a time, back the tap out, clean out the shavings, and test fit the

nozzle to the NPT threaded hole. When you are finished threading or drilling the charge pipe, thoroughly clean and blow out all shavings from the inside of the pipe before reinstalling it back on the engine.

- C. Install the nozzles in the threaded holes. Make sure the nozzles are pointing in the correct direction. The outlets should face toward the intake manifold. The nozzle has a dimple machined into one of the flats on the hex of the nozzle that indicates what direction it is facing. Use this dimple as a guide to ensure the correct orientation of the nozzle.
  - D. Install the 1/8 NPT end of the 2ft. -4 nozzle feed lines into the nitrous solenoid outlets (Fig. 4). Install the nitrous jets in the nozzles for the desired power levels and attach the -3 AN swivel nut side of the nozzle feed line to each corresponding nozzle. Each individual nitrous stage can be jetted from 50hp-300hp, so the ZEX™ Race Diesel Nitrous System has a total combined maximum capability of 600 additional horsepower. **Remember, a nitrous jet's power rating is the maximum amount of additional power it can support, but this power level will only be achieved through additional fuel tuning.**
  - E. Attach the -4AN nitrous delivery lines, from each of the bottles, to the nitrous solenoid inlets.
- 6. Install boost pressure switch.** Locate the rubber line that connects your turbo's wastegate pressure fitting to the manifold pressure fitting. Cut this rubber line and install the Boost Pressure Switch "in-line". Secure the rubber hose ends that have been slipped over the Boost Switch's hose barbs with a couple plastic tie straps.

**The boost pressure switch is adjustable from 2-24psi, but is factory set at 7psi. Adjustments are made using the 5/64 Allen screw located on the boost switch itself. Clockwise will increase the boost activation point and counterclockwise will decrease the boost activation point. You generally want the nitrous to start spraying once the engine's computer starts to add lots of enrichment fuel. This occurs primarily when the boost starts to build-up. Remember, the nitrous only makes power when the extra enrichment fuel is present. You do not want to start spraying the nitrous before the engine builds boost. If you do, there isn't so much a safety issue, but the engine will generally lose some power until the boost comes up and the fuel becomes available to burn with the nitrous.**

## 7. Wiring

- A. **Mount the arming switch** in an easily accessible area for the driver and connect one of the posts to a 12 VDC + switched accessory wire. Run an additional wire lead from the other switch post to the accelerator pedal area. This wire will be attached to the red wire on the ZEX™ electronic activation TPS switch.
- B. **Mount the second stage activation pushbutton** in an area that the driver can easily press while the vehicle is accelerating.
- C. **Wire the TPS switch.** The ZEX™ system uses an advanced TPS switch that activates the nitrous system at wide open throttle based on the voltage it reads from the vehicle's TPS sensor. This Throttle Position Sensor (usually located by the accelerator pedal) provides information to the engine computer on how far down the accelerator pedal has been depressed. This sensor will have several wires coming off of it, but at least one of these wires varies it's voltage as the accelerator pedal is moved through it's normal range of operation. Typical values are .5 volt at idle, gradually increasing to 4.5 volts as the pedal is moved to wide-open-throttle. Your

vehicle's voltage range may be significantly different than this, but not to worry, the ZEX TPS Switch will program itself to any voltage sweep it measures. The important thing to remember is to locate the TPS wire that outputs a voltage that varies with accelerator pedal position. A volt-meter is very useful for measuring for TPS voltage or you may choose to visit your local vehicle dealer's parts department to view a wiring schematic for your vehicle's TPS sensor circuit. Once the proper voltage output wire has been identified, attach/tee the white wire from the ZEX TPS Switch to it. The provided red t-tap connector makes tapping into this wire very easy. Refer to the wiring diagram at the end of this instruction sheet for the proper wiring connection points and locations.

- D. **To enable the TPS switch to properly program itself to your vehicle, temporarily bypass the normally open circuit on the Boost Pressure Switch by connecting the white wire from the ZEX™ TPS switch to the normally closed post#2 on the Boost Pressure Switch. Once the ZEX™ TPS switch is programmed properly and you have tested the solenoids for proper operation, you can then swap the white wire from the ZEX™ TPS switch back to post#3 on the Boost Pressure Switch for normal operation.**
- E. **Program the ZEX™ TPS activation switch.** To begin, turn the vehicle's ignition on, but do not start the engine. Turn the nitrous arming switch to the "ON" position. Go to the ZEX™ TPS activation switch and locate the push-button. Depress, then release, the push-button switch. Observe the Operation LED on the box. At this point, it should be RED. This RED light informs you that the TPS switch is in learn mode. Return to the driver's seat and depress the accelerator pedal to the floor, holding it there for ten seconds. Release the accelerator pedal and go back to the TPS switch and observe the Operation LED. At this point, the light should be flashing continuously from RED to GREEN to OFF. This is the TPS switch's way of telling you that it has successfully learned the voltage curve of your vehicle's throttle position sensor. Go back to the driver's compartment and turn off the system's arming switch, then turn it back on. Go back to the TPS switch and observe the Operation LED. It should be solid GREEN at this point. This informs you that the system is armed and ready to activate at wide-open throttle. Depress and release the accelerator pedal several times. You should hear the first stage solenoid click each time you reach wide-open throttle. To test the second stage solenoid, first press the accelerator pedal to the floor, you should again hear the first stage solenoid click. At this point, press the second stage pushbutton, you should hear this second solenoid click as well. After these tests are successful, your Activation Switch is fully programmed, remember to reconnect the Boost Pressure Switch to the white wire going to your TPS activation switch. If you ever transfer your nitrous system to another vehicle, perform this same procedure on the new vehicle to "relearn" the Throttle Activation Switch.

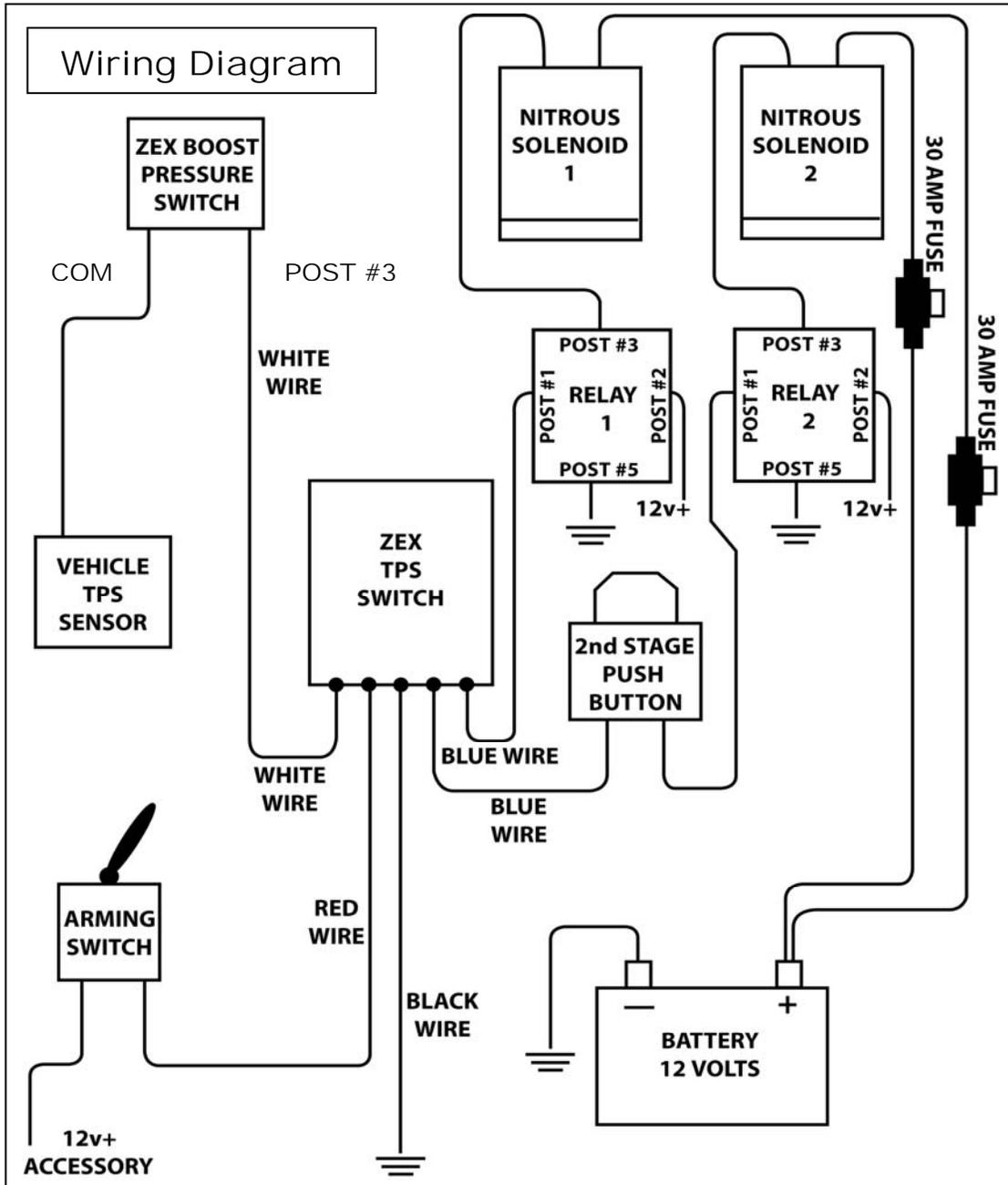
## 8. Final inspection.

- A. Perform a final inspection of all plumbing and electrical connections to ensure that they are correct.
- B. Open the nitrous bottle valves and listen carefully for any leaks as the valves are opened. Leaks in the nitrous supply lines or fittings will be obvious because they will be covered in frost.

## ZEX™ #82044 Race Diesel Nitrous System Jet Chart

	50 hp	100 hp	150 hp	200 hp	250 hp	300 hp
<b>Nitrous Jet (950psi)</b>	32	46	62	74	88	125

Each individual nitrous stage can be jetted from 50-300 hp, so the ZEX™ Race Diesel Nitrous System has a total combined maximum of 600 additional horsepower. **Remember, a nitrous jet's power rating is the maximum amount of additional power it can support; it must have additional fuel tuning to achieve its maximum rated power.**



## Limited Warranty

ZEX™ warrants that all of its products are free from defects in material and workmanship, and against excessive wear for a period of (1) one year from the date of purchase. This **limited warranty** shall cover the original purchaser.

**ZEX's obligation under this warranty is limited to the repair or replacement of its product.** To make a warranty claim, the part must be returned within (1) one year of purchase to the address listed below, freight prepaid. Items covered under warranty will be returned to you freight collect.

**It is the responsibility of the installer to ensure that all of the components are correct before installation. We assume no liability for any errors made in tolerances, component selection, or installation.**

**There is absolutely no warranty on the following:**

- A) Any parts used in racing applications;**
- B) Any product that has been physically altered, improperly installed or maintained;**
- C) Any product used in improper applications, abused, or not used in conjunction with the proper parts.**

**There are no implied warranties of merchantability or fitness for a particular purpose.** There are no warranties, which extend beyond the description of the face hereof. ZEX™ will not be responsible for incidental and consequential damages, property damage or personal injury damages to the extent permitted by law. Where required by law, implied warranties or merchantability and fitness are limited for a term of (1) one year from the date of original purchase.

This warranty gives you specific legal rights and you may also have other legal rights, which vary from state to state.