

# THUNDER MAX

## Nitrous Assisted Dry System #109-213

**This product is legal in California only for racing vehicles which may never be used upon a highway.**

Please read through the instructions entirely before performing this installation. **If you do feel not capable to perform this work, we strongly recommend you find a professional installer. If you are not entirely confident in what you are doing, then stop now.** This kit is designed to be installed on modified engines using oversize ThunderMax® throttle bodies. Based on your engine's output it will likely require oversize injectors and base map calibration changes for the selected injectors. This system is not designed as a "bolt on and ride Nitrous kit" as will require some degree of professional tuning. This product is sold as a 2-part kit, the main component consisting of the air cleaner backplate with solenoid assembly, air filter and harness. The bottle and bottle mounting brackets are sold separately (model specific). It requires a ThunderMax® ECM and is best used with the ThunderMax® Auto-Tune module.

### How a 'Dry' System Works

A 'dry' system introduces the required extra fuel nitrous demands through the EFI fuel injectors, rather than using a secondary fuel delivery system. The ThunderMax® ECM has programming built in that recognises the nitrous system and increases the fuel 'pulse width' when activated. Once additional fuel is introduced, it burns with extra oxygen provided by the nitrous, providing additional power.

### Installation

1. Remove the air cleaner cover, element and backplate from the motorcycle. Retain the original cover screw for future use.

2. Electrical Harness Installation: Remove the ECM fuse. Disconnect the negative battery cable. Locate the ThunderMax® ECM and disconnect the wiring harness connector from it.



3. Route the NADS electrical harness along the backbone of the motorcycle and position the end of the harness near the ECM.

Note: Depending upon your model, you may need to remove the seat and/or raise the gas tank to route the harness.

Carefully pry the strain relief (gray housing) of the ECM connector apart.



4. Depress the tabs on the connector retainer (clear plastic) and remove it from the connector.



5. Locate positions 9 and 32 on the "wire side" of the connector. On the nitrous harness, insert the terminal of the white w/black tracer wire into position 9 and the terminal of the yellow w/black tracer wire into position 32. Be sure to insert them until they "click" into position and are at the same depth as the other terminals.



6. Re-install the connector retainer. Position the wires of the nitrous harness so that they exit the strain relief along the same path as the OEM wires. Close the halves of the strain relief around all the wires.



7. Insert the connector back into the ECM.



8. Locate the data link connector. Connect the four-position Deutsch connector on the nitrous harness into the data link connector. (If you are also using ThunderMax® AutoTune, you must purchase a Data Plug 'Y' Harness, # 309-343, to run both systems.)



9. Use wire ties to secure the harness to the motorcycle.



10. Assuming that you have already mounted the ThunderMax® throttle body/manifold to your engine per instructions, install the NADS backplate and air cleaner assembly with the following supplied components:

- (2) Breather bolts with
- (4) Washers 2 ea 3/8, 1/2" ID
- (2) Breather vent banjo fittings
- (2) Socket head bracket screws

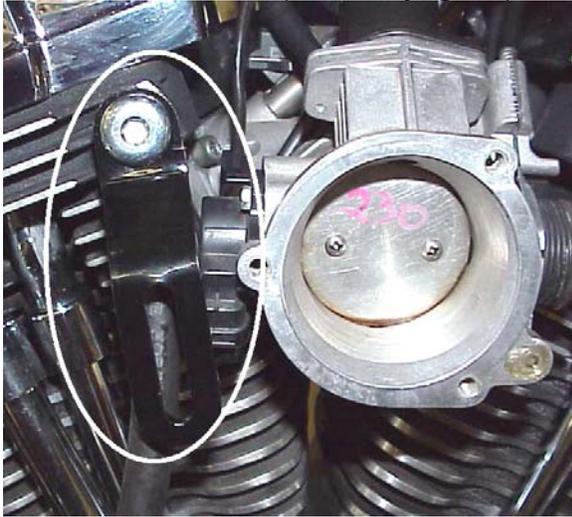


- (2) Air cleaner support brackets
- (1) 5/16" ID shim washer assortment
- (1) Air filter element
- (1) Air cleaner backplate w/stanchions
- (1) Air cleaner cover washer
- (2) 5/16-18 x 1-1/4" buttonhead bolts
- (2) 5/16 hardened washers
- (2) 5/16-18 locknuts
- (3) 1/4-20 x 1/2" Torx-head A/C-to-stud screws
- (3) Nylon washers
- (3) 1/4-20 x 3/4" Torx-head cap screws

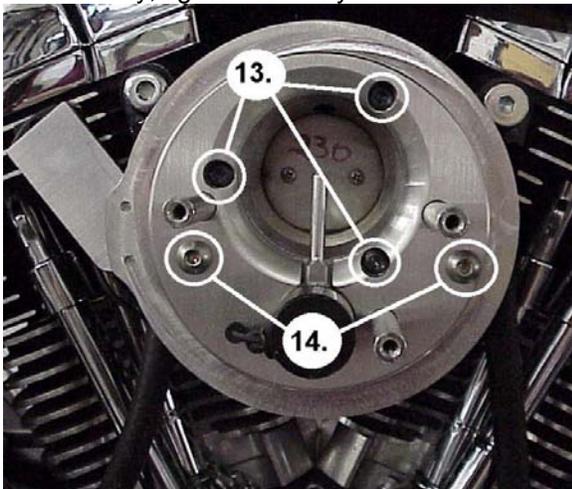
11. Apply blue Loctite® and install banjo fitting with sealing washers covering both sides onto each banjo bolt. Install banjo fitting assemblies into breather ports on heads and tighten, with banjo hose fittings facing down. Attach suitable 3/8" vent hose to banjo fittings and rout vent hoses to atmosphere or accessory breather filter(s).



12. Install backplate support brackets over raised bosses in banjo bolts, secure with 5/16-24 socket head screws (do not fully tighten).

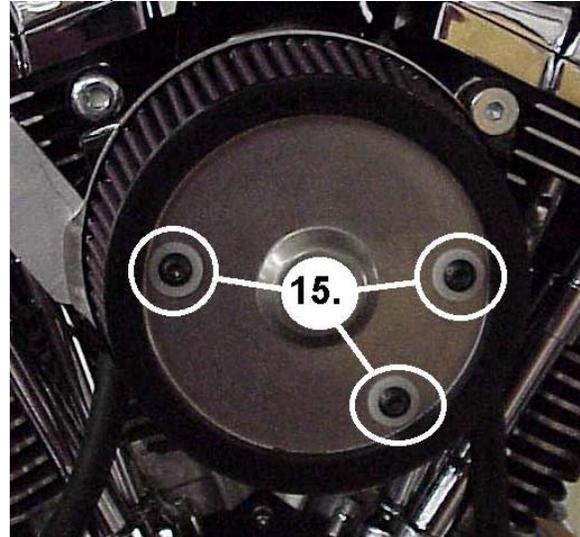


13. Apply blue Loctite to (3) 1/4-20 x 3/4 Torx-head socket screws and install backplate to throttle body; tighten securely.



14. Attach backplate to support brackets using 5/16-18 bolts, nuts and washers provided. Use shims provided to fill any gap between bracket and backplate so that there is no stress or binding between the bracket and backplate while tightening (brackets may be bent slightly to ensure even alignment with backplate). Tighten the 5/16-24 sockethead screws securing the brackets to the banjo bolts.

15. Install air filter onto backplate, line up holes to stanchions. Apply blue Loctite and attach with (3) 1/4-20 Torx head screws and nylon washers and tighten (do not distort plastic washers).



16. Install the original air cleaner cover screw through the air cleaner cover. From inside the cover, install the supplied thick 5/16" washer over the air cleaner cover screw threads. Apply a drop of LOCTITE THREADLOCKER 243 (blue) to the threads of the air cleaner cover screw. Position the air cleaner cover over the filter with the washer positioned between the air filter and the cover. Install the screw and tighten to 36-60 in-lbs.





## Software Setup

You should always check to see if you are running the latest available version of SmartLink software and your module's firmware is up to date. Software and firmware updates are available with a high-speed Internet connection through your SmartLink software. Please verify you have the latest version before you proceed.

You must have a ThunderMax® ECM # 309-340 (modular type) to use the NADS system. Earlier, first generation ThunderMax® may also be used if purchased after March 1 2006, and are identified by a laser-engraved "E" on the right hand side of the module lower casing, below the main harness plug opening.

Open the SmartLink software. Link to the module and select [CONFIGURE], scroll down to [MODULE SETTINGS] ► [NITROUS] and the following dialog page appears:

Nitrous Setup	
Nitrous	
<input checked="" type="radio"/> Enable <input type="radio"/> Disable	
Strategy	Engine RPM
0 id	3008 rpm
Vehicle Speed	Fuel Enrichment
45 MPH	20 pct
Delivery Delay	Ignition Timing
0 msec	5 deg
OK	

### DEFINITIONS:

**1. Nitrous Enable/Disable** - Enables (turns on) or disables (turns off) all nitrous functions, regardless of other settings or switch positions.

**2. Strategy** - (Not used at this time) Strategy window is reserved for future expansion of the system. There is no function available currently.

**3. Engine RPM** - Sets minimum rpm for nitrous activation (maximum rpm remains located in [BASIC SETTINGS] under [REV LIMIT]).

**4. Vehicle speed** - Minimum vehicle speed for nitrous activation regardless of other settings.

**5. Fuel Enrichment** – Percentage of additional fuel that will be applied to the installed base map during nitrous activation. Target AFR's in the low to mid 11's are safe. More power may be available with a leaner mixture.

**6. Delivery Delay** – Fuel and timing. Sets a time delay due to solenoid opening and purging of air in the system. Fuel enrichment and timing adjustment are delayed by this number in milliseconds after all other conditions are met.

**7. Ignition Timing** - A flat value of spark retard on nitrous activation.

### Summary of Operation

The NADS system has only has 2 states, "Active" and "Not Active". In order to go into the active state all of the following conditions must be met:

**1.** System must be "enabled" from nitrous menu in SmartLink software.

**Note** - This is done by clicking on "configure" on the tool bar and then "module settings".

**2.** The arming switch, located on the air cleaner backing plate, must be moved from the "disarmed" to the "armed" position after the engine is started. This prevents accidentally leaving the arming switch on between rides from causing an inadvertent charge of Nitrous or activation on the following ride.

**Note** - On some models, the check engine and battery lamp will be lit together when the system is armed to provide another visual reminder that the system is in an active mode. This is normal and intended.

**3.** Rpm must be above the target nitrous menu rpm setting and below the prescribed rev limit.

**4.** Vehicle speed must be above the nitrous menu vehicle speed setting.

## Suggestions and Recommendations

The bottle is equipped with a valve that can be opened or closed. We suggest closing the valve when not in use. Extra bottles are available for purchase to quickly replenish exhausted nitrous.

Change and vent bottles only in a well ventilated area. When changing the bottle, close the bottle valve before disconnecting the line. Slowly loosen the line until a hissing sound is heard; let the line pressure escape slowly. Do not inhale nitrous as continued exposure can cause death. Do not allow liquid nitrous to touch your skin as it will burn like dry ice. Carefully check for leaks any time a connection has been broken. Do not use Teflon® tape on the tapered line fittings.

With a 12oz bottle, you can expect 3-4 full throttle pulls per bottle. Degree of engine modification and engine size will affect this estimation.

When the available nitrous is used up and the system remains enabled, The additional fuel dictated by the active system will cause the engine to run in a rich condition absent the presence of available nitrous. Turn off the arming switch to avoid overfueling the engine when the nitrous runs out.

**Adding nitrous oxide to your engine and properly managing it can significantly increase its output. Used improperly, it can also shorten its lifespan. The purchaser of this system assumes all responsibility in regards to its usage and compatibility. Zipper's and/or Thunder Heart are not responsible for your engine, and/or the safety of others or yourself.....YOU ARE. There should be no reason why you cannot achieve success with this product. This conservative kit should not damage your engine, but it is certainly possible. Depending on your riding habits and quality of installation, damage to your engine may be a real possibility. Neither Zipper's or Thunder Heart Performance is responsible for any consequential damage related to the use of this product. Nitrous oxide designed for vehicle use should never be inhaled as it contains sulfur dioxide which can cause death. Contact with liquid may cause burns/frostbite. Never vent nitrous oxide in a confined space. Wear safety glasses and rubber gloves when handling.**

## Conservative Settings



The screenshot shows a 'Nitrous Setup' dialog box with the following settings:

Parameter	Value
Nitrous	Enable
Strategy	0 id
Engine RPM	3008 rpm
Vehicle Speed	45 MPH
Fuel Enrichment	20 pct
Delivery Delay	0 msec
Ignition Timing	5 deg

An 'OK' button is located at the bottom center of the dialog box.

Lower fuel enrichment settings will increase performance but will lean out the air/fuel ratio

Target air/fuel ratio while system is activated is between 11.25 and 11.75

Thanks for your purchase of our product!

**THUNDER  
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