



Water/Methanol Stage 3 Instructions

Read all Instructions before beginning!!!!

Caution – EXTREME DANGER – Caution

Do not use or mix any other manufacturer's products with any Nitrous Express products.

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THESE INSTRUCTIONS APPLY TO NITROUS EXPRESS PRODUCTS ONLY!

FOR SANCTIONED RACE USE ONLY - NOT FOR SALE OR USE IN CALIFORNIA

CAUTION: You must completely read through these instructions before installing and operating this product. Failure to do so can result in damage to this product and the vehicle

Required Tools Needed For Install:

- Phillips/Flat Head Screwdriver
- Power Drill
- Razor Blade
- Preferred Electrical Connectors (Crimping/Stripping Tools, Blue Butt-connectors, Eye Hooks, Posi-Taps, Fuse Taps, Soldering Supplies, etc.).
- Spare 16 Gauge Wire (Optional Depending On Install)
- Open End Wrench / Socket Set
- 1/8" – 27 NPT Tap (Optional Depending On Install)

****Teflon sealants are not compatible with methanol, and should not be used!**

Average Install Time: 4-6 Hours

Tank Install

OPTIONAL: If desired, you can use the stock windshield washer fluid tank as the tank for your water-meth system. Simply drill and tap a 3/8" NPT hole in desired feed spot for system and install the 3/8" NPT fitting into the tank using E-6000 sealant on threads/around area.

(Note: The reservoir should be installed above the pump, but below the nozzle. This keeps the pump primed and avoids fluid leaking into nozzle when not in use)

BRAIDED LINE KITS ONLY:

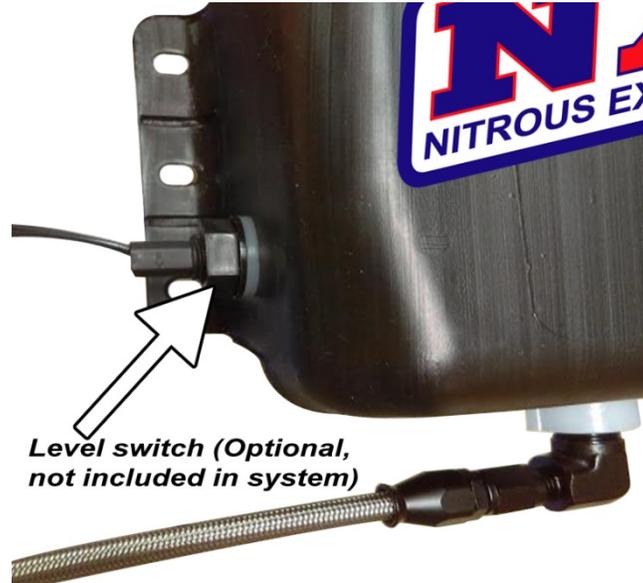
Step 1: Install 3/8" NPT to 1/4" Quick Connect fitting or 3/8" NPT to 4AN Elbow fitting into the bottom of the reservoir using E6000® sealant on the threads. (See illustration A)

Step 2: After allowing the thread sealant to dry, fill reservoir with water and check for leaks around tank fitting and level sensor. If leak occurs use E6000® sealant.

Step 3: Install the 3qt. tank with four (4) #8x1&1/2" self-tapping screws and four (4) #8 washers (supplied) in desired mounting location. Typical placement is any void area inside the engine bay.

To avoid gravity feeding of fluid with rear mount reservoirs, it is essential to use a solenoid upgrade (NX Part # 15055). Do not operate your rear mount reservoir equipped vehicle without an anti-siphon solenoid installed.

Illustration A



Level switch (Optional, not included in system)

Pump Install

Braided Line Kits Only: Install (2) 3/8" NPT to 4AN Straight fittings into the pump inlet and outlet using E6000® sealant on the NPT threads on the "pump side" of the fitting. Do not overtighten as damage to the pump housing can occur.

Quick Connect Kits Only: Remove the blue rubber plugs from the quick-connect fittings by first pushing the plug toward the pump, hold the grey collar against the pump, and gently pull the blue plug from the fitting. **Warning: Pulling against the quick connects with excessive force may cause fitting damage.**

Step 1: Position the fluid pump so that the inlet is positioned at or below the lowest point of the reservoir, and within two feet of the reservoir. (Pump can be installed in any orientation). This will ensure the pump is primed with fluid for optimal flow and pressure to the nozzles.

****Arrows on the pump inlet and outlet indicate the direction of fluid flow****

Step 2: Install the fluid pump with four (4) #8x1&1/2" screws and four (4) #8 washers (supplied) in desired mounting location.

Step 3: Fit the high temperature nylon tubing or braided line between the tank outlet fitting and the pump inlet, ensuring there are no kinks in the line and there is no stress on the fittings. Sharp kinks/bends can cause a leak in the system.

Braided Line Kits Only- Using either the 1ft or 2ft (whichever better suits your mounting location in your application) stainless braided line section supplied in the kit connect the tank outlet to pump inlet.

Quick Connect Kits Only- Once high temperature nylon is measured from tank outlet to pump inlet cut tubing using razor blade. Remove any burrs so that the fluid line properly seals against the internal o-rings inside the quick connect fittings. Insert tubing into the quick connects until fully seated, and pull lightly against quick connects to ensure proper installation between tank outlet to pump inlet

Illustration B
Pump In/Out Fittings



Caution!!! Pump must be shielded from road debris and direct tire wash. Failure to do so will result in pump failure!

Nozzle Selection:

Nozzle Number (Stamped On Side Of Nozzle)	Nozzle Size
1	60 ML/MIN
2	100 ML/MIN
3	175 ML/MIN
4	225 ML/MIN
5	375 ML/MIN
6	625 ML/MIN

Locate your water-methanol nozzles included in your system and compare the number stamped on the side to the above chart to determine its size. Nozzle sizing is determined by horsepower (which approximates the engine airflow) and boost (which approximates intake charge heat).

Determine your vehicle's horsepower and max boost pressure to determine what size nozzle is needed for your application using the nozzle selection chart below.

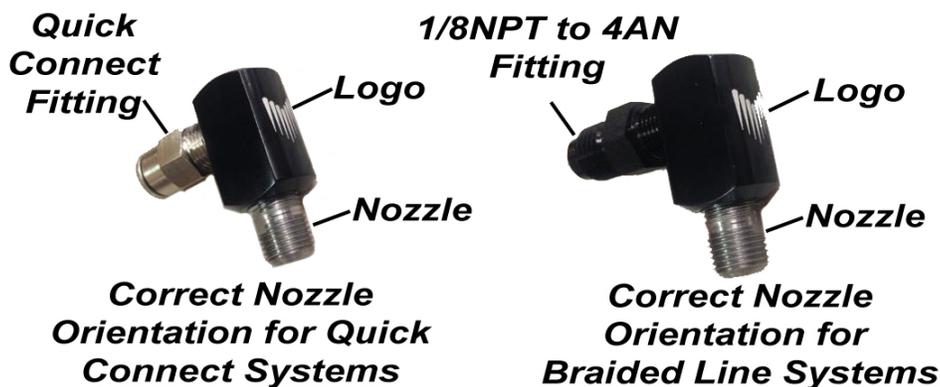
Forced Induction	Nozzle Size
200-400 HP	#3 175 ML/MIN
400-600 HP	#5 375 ML/MIN
600-800 HP	#6 625 ML/MIN

Naturally Aspirated	Nozzle Size
200-350 HP	#1 60 ML/MIN
350-650 HP	#3 175 ML/MIN
650-850 HP	#5 375 ML/MIN

Seal the appropriate nozzle into the nozzle holder fitting using E6000® sealant on the nozzle threads.

****The end of the nozzle with the fine mesh screen should be inserted into the nozzle holder**** (See Illustration C)

Illustration C



Nozzle Mounting:

Typical nozzle placement is approximately 6 inches or less before the throttle body inlet on the engine, but the nozzle can be installed anywhere on the intake pipe after an intercooler outlet, supercharger outlet, or turbo outlet. If an intercooler is being used, the nozzle should always be placed after the intercooler due to the possibility of the narrow passages and loss of air velocity leading to puddling. In applications with a Mass Air-Flow sensor (MAF), nozzle should be mounted after the MAF sensor due to the possibility of causing a faulty sensor reading. For positive displacement supercharger (roots style), nozzle may be mounted before the supercharger.

Mounting for metal and rigid plastic: Drill and tap the intake tube with 11/32" drill bit and a 1/8"-27 NPT thread tap in desired nozzle mounting location.

*****To prevent debris from entering the engine, remove the intake tube from the vehicle prior to drilling*****

Mounting in rubber boot (Nozzle Mounting Adapter Part# 15056):

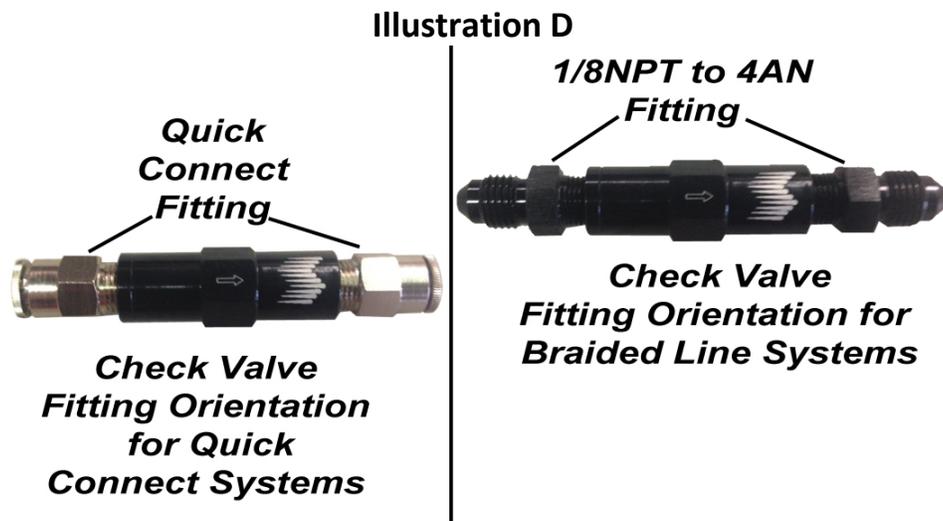
1. This adapter allows a secure threaded connection in any rubber intake boot for water-methanol nozzles.
2. Install the nozzle at a 90° angle to the direction of airflow, and so that the nozzle tip is flush with the inside of the intake tube or protruding slightly to ensure an uninterrupted spray pattern.
3. Ensure the nozzles cone of spray has no obstructions near the mounting location.
 - a. Install the nozzle assembly into the threaded intake tube using E-6000 sealant on the nozzle threads.
 - b. Using an open end wrench, tighten the nozzle assembly ½ turn past finger tight so that the nozzle head is flush with the inside of the intake tube.
 - c. Re-install the vehicle's intake tube into its proper mounting location.

High Flow Check Valve Install

The check valve assembly (35 PSI Check Pressure) will ensure that boost pressure does not back-feed air into the system or siphon due to engine vacuum. Ensure the check valve is installed with the arrow pointing in the direction of flow. The check valve may be installed anywhere between the pump and nozzles. In a dual nozzle application the check valve will be placed between the pump and T fitting.

Quick Connect Kits - Fit the NPT thread to quick connect adapters in both sides of the check valve using E-6000 sealant on the threads. Press the high pressure tubing in each fitting, ensuring the check valve is oriented properly in the direction of flow.

Braided line kits - Fit the NPT thread to 4AN adapters in each side of the check valve using E-6000 sealant on the NPT threads **only**. Connect the 5 foot section of braided line from the pump outlet to check valve inlet and the 1' or 2' section of braided line from the check valve outlet to the nozzle holder inlet.

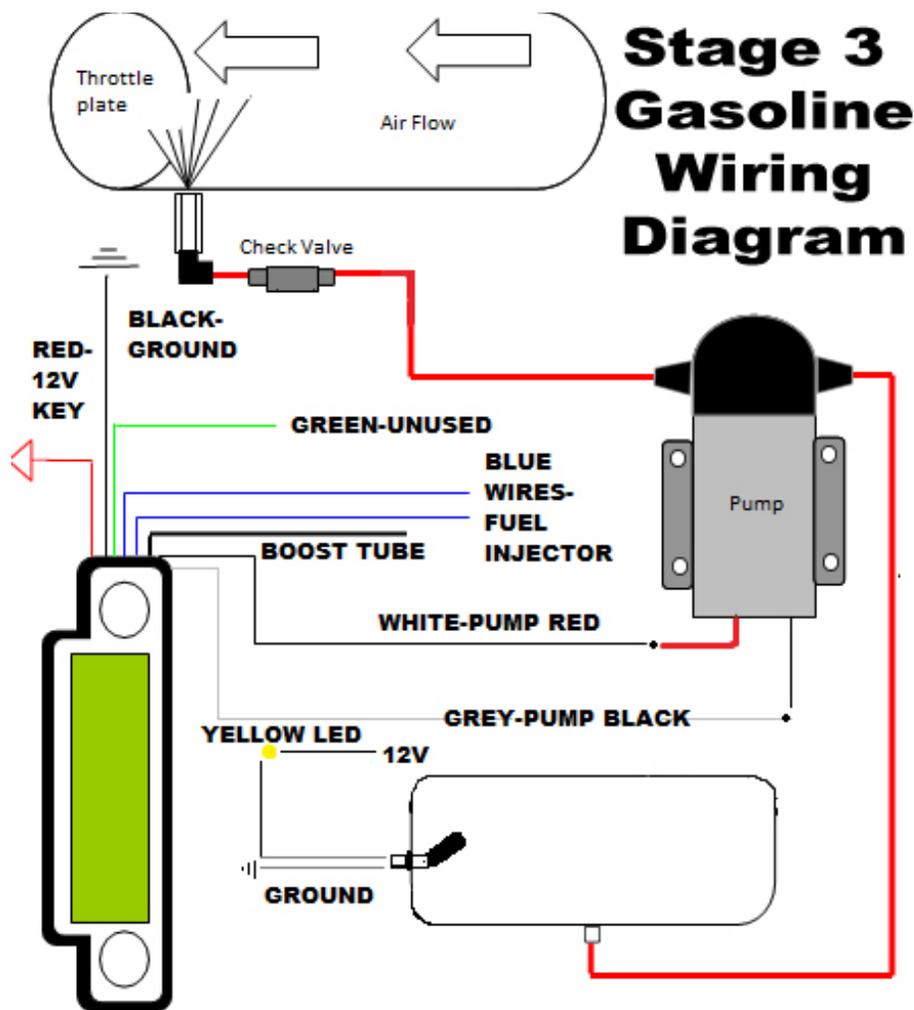


Ensure the lines are clear of the serpentine belt system. When routing the high pressure tubing or braided line from the in-line check valve to the nozzle holder location, avoid extreme heat sources (such as exhaust piping) and any area that may abrade the line due to engine vibration and torque over.

Wiring the System

To complete your water-meth install follow the subsequent electrical wiring diagram/instructions.

Note: The wires on the level sensor / LEDs are interchangeable, it does not matter which wire connects to ground/12V source.



1. Mount controller in desired location using double sided tape. Ensure mounting surface is clean before applying tape.
2. Connect boost hose (black silicon hose supplied in kit) to the clear blue boost line coming from the controller. Connect other end of black silicon hose to accurate boost source using included boost "T" fitting.
3. Using preferred electrical fitting connect BLACK wire to good ground location.
4. Using preferred electrical fitting connect WHITE wire to Pump RED power wire.
5. Using preferred electrical fitting connect GREY wire to pump BLACK ground wire.
6. Using preferred electrical fitting connect each BLUE wire to the wires on a single fuel injector. The wires are interchangeable.
7. Using preferred electrical fitting connector connect RED wire to 12 volt key on power source.
8. GREEN wire is only used to control a second stage of water/methanol. If a solenoid/dual nozzle upgrade is not being used GREEN wire can be tied out of the way. If a solenoid/dual nozzle upgrade is being used follow upgrade installation guide for proper installation.

Adjusting controller settings

The Stage 3 system allows for a large range of tuning on any EFI or forced induction vehicle. It can reference fuel injector pulse-width, boost, or both simultaneously. It has two fully progressive stages of injection to cover not only high load/high performance driving, but also moderate driving such as going up a hill or accelerating away from a stoplight.

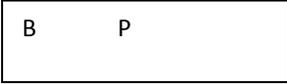
The boost and EFI data are displayed on the LCD screen, along with the system's output as a percentage of pump capability.

All functions of the controller are accessed using the two push buttons to the left and right of the LCD screen. Pressing button 1 will scroll between screens, while pressing button 2 will affect whatever setting is on the screen.

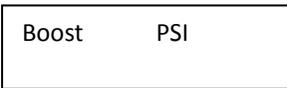
CAUTION: The controller has a “**read only mode**”. If you wish to observe boost and fuel injector pulse width data without injection, proceed to a display screen, then press and hold button 2. Then press and hold button 1. Finally, release both buttons simultaneously. This will toggle between read only mode and normal operation.

Holding down button 2 while powering up the unit will engage metric units (BAR). Holding down button 1 while powering up will set standard units (PSI). Once this has been done once, it is not necessary to specify units again. The controller comes pre-set to standard units (PSI).

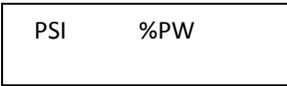
Display and Control Screens:

Screen 1 

This is a display only screen. It displays boost, fuel injector pulse-width (PW), and water/methanol injection as independent bar graphs.

Screen 2 

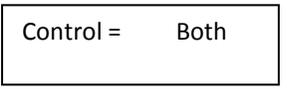
This display screen shows boost in psi and injector pulse-width (PW) as a percentage. 100% pulse-width indicates 100% injector duty cycle and a fuel system injecting as much as possible

Screen 3 

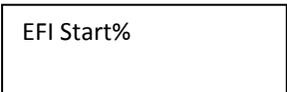
This screen displays boost in psi, while pulse-width (PW) and injection are shown as a percentage.

Screen 4 

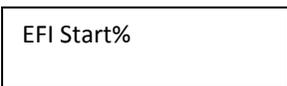
This screen displays boost in psi and pulse-width (PW) as a percentage.

Screen 5 

This is the **first setup screen**. It allows you to select BOOST, EFI, or BOTH, using button number two. If BOOST is selected, then boost alone will determine the injection volume of the nozzle. If EFI is selected, then fuel injector pulse-width (PW) alone will determine injection volume for the nozzle. If BOTH is selected then both inputs will be used simultaneously to control injection.

Screen 6A 

This screen sets the injector PW point when injection will start through the system. Typical start points are in the 20% range. Press button 2 to increase this value.

Screen 6B 

This screen sets the injector PW when injection will start through the system. Press button 2 to decrease this value.

EFI Full%

Screen 6C

This screen sets the fuel injector PW full point when maximum injection through the system will be reached. Typical EFI full points are 40%-60%. Press button 2 to increase this value.

EFI Full%

Screen 6D

This screen sets the fuel injector PW full point when maximum injection through the system will be reached. Press button 2 to decrease this value.

Boost Start

Screen 7A

This screen sets the boost pressure required to start injection through the system. This should be set at a boost that just above what you might get cruising normally at freeway speeds.

Boost Start

Screen 7B

This screen sets the boost required to start injection through the system. Press button 2 to decrease this value.

Boost Full

Screen 7C

This screen sets the boost full point when maximum injection through the system will be reached. In most applications, this should be set at a boost achieved in moderately hard driving.

Boost Full

Screen 7D

This screen sets the boost full point when maximum injection through the system will be reached.

PW/Boost Control

Screen 8A

This screen adjusts the balance between boost and PW based injection on the system. Pressing button 2 will **increase** the PW importance and decrease the boost importance by 1%. If it is set at 50/50, then PW and boost are weighted equally to determine how much to inject at any given time. The weighting can be adjusted in 1% increments. 50/50 is often a good starting point.

PW/Boost Control

Screen 8B

This screen will **decrease** the importance of PW while increasing the importance of boost in 1% increments as you press button 2. Decreasing the weight of boost is useful for quick spooling turbos or positive displacement superchargers in EFI applications.

Screen 9

Power Mode EFI

This screen will determine what variable will command a second stage of injection. This should be set to "Boost".

Screen 10A

Power Start

This screen sets the start point of either boost or PW that triggers the second stage of injection. This must be set to a boost value not reached on the vehicle to avoid a fault.

Screen 10B

Power Start

This screen sets the start point that will trigger a second stage.

Screen 10C

Power Full

This screen sets the full point when maximum injection will occur with the second stage. When the value is reached, both nozzles will be injecting at 100% for maximum cooling and octane gain. Set to boost value not reached on the vehicle to avoid fault.

Screen 10D

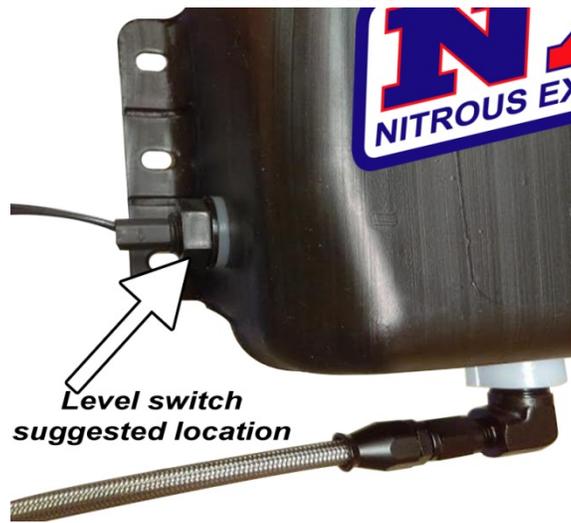
Power Full

This screen sets the full point when maximum injection will occur with the second stage.

Optional Level Switch Upgrade w/LED

Although not required for kit operation, the low level sensor and led are a great way to monitor the level of your water-methanol tank. The level sensor is designed to turn on the led (or alert the controller in some kits) as soon as the level inside the reservoir reaches the level of the sensor.

Illustration X



Step 1: Remove plastic nut, plastic ring, and clear rubber gasket from level sensor assembly.

Step 2: Using a stepped drill bit. Drill the hole for the level sensor at the location in the tank you want to be alerted. Typical placement is 1/3rd of the tank height.

Step 3: Remove the cap from the tank and feed/pull wires through hole until level sensor is seated against plastic stopper.

Step 4: Reinstall the clear rubber gasket, plastic ring, and plastic nut onto the level sensor.

Step 5: Push clear rubber in until flush with outside of reservoir.

Step 6: Align the switch so the arrow is facing down. If arrow faces another direction the sensor will not operate.

Step 7: Tighten the plastic lock nut until the rubber gasket pushes firmly on the wall of the reservoir creating a leak free seal.

Testing the System

You are now complete with your Stage 1 Water/Methanol install. Check the system for any leaks/correct wiring.

Follow the below steps to test the system before use.

Step 1: Make sure tank is filled with fluid.

Step 2: Arm systems by putting key in the ignition.

Step 3: Remove nozzle from intake location. Place in location that is easy visible. Click the WOT micro-switch by hand, or connect the two wires from the Boost switch together; the system should engage, and fluid should be atomized out of the nozzle. If no injection occurs check wiring/grounds for the system.

Step 4: Enjoy increased octane! See tuning tips / FAQ at the end of these instructions for more info.

Tuning Quick Reference

The power potential of the system is realized through increased boost and/or timing. The large gains on octane and cooling provided by the system make this possible, even on standard pump fuel.

The water/methanol mixture adds an alternate fuel source as well as significantly cools combustion. With water/methanol, one does not need to cool combustion with overly rich air/fuel ratios. To minimize combustion quench, you should start with an air to fuel ratio of 12.0-12.5:1. **NOTE: Injecting water/methanol lower than 3300-3500 RPM could result in combustion quench.**

All vehicles are different. If the engine bogs or loses power, then injection is starting too early, the quantity is too much, or there is not enough methanol in the mixture (50/50 water/methanol recommended).

Maintenance

Remove nozzle(s) and clean screen filters once per year using a calcium removing formula such as CLR®.

Oil or other additives are not required for system lubrication, and can cause damage to the system.

Contaminants in the fluid such as dirt can damage the system. Ensure that dirt and debris do not fall into the tank. This can lead to solenoid/pump failure.

Do not use Teflon tape or paste to seal connections. These sealers are not as effective as the E-6000 sealant provided and can break down over time with high methanol use, clogging components.

Water-Meth FAQ

Q: How long will a 3 Qt tank of water/methanol last?

A: This depends on a number of variables (HP, injection system, settings, driving style, etc.) For most gasoline engines in the 250-550 HP range the standard 3Qt reservoir will last around two 12-15 gallon tanks of gasoline.

Q: What fluids can I use in my water/methanol system?

A: Windshield Washer fluid: Only if it is blue in color and rated for -20 deg F. It should have no special additives. This means it is safe to use and made of 30% methanol, 70% water. If it is another color or another temperature rating, **do not use it**. You can “spike” your Blue -20 Washer fluid to a 50% mixture by adding 3 12OZ yellow bottles of Heet® gas-line-antifreeze to every gallon of washer fluid.

- Mix your own: You just need to make sure the methanol is “neat” and contains no lubricants or other additives. We recommend a 50% mixture by volume of M-1 pure grade methanol and distilled water.
- Do NOT use E85 or any other fluid with gasoline mixed in. It will destroy the fluid delivery part of your system and instantly void the warranty.

Q: Do I have to have a custom dyno tune with a water-meth kit?

A: While extremely recommended for maximum performance and safety while injecting water-methanol, a custom tune is not necessary to operate the vehicle as long as the following are met.

- 1) The vehicle is not utilizing an existing custom tune for the water-methanol
- 2) A low methanol concentration is being injected and not severely effecting the air/fuel ratio. Consult your local dyno professional for tune / recommendation.

Q: What ratio of water/methanol is recommended?

A: A 50/50 ratio is recommended for maximum performance and safety. Ratios of anywhere from 30% to 50% methanol work well and deliver excellent octane gains and cooling without over richening the air fuel ratio.

Q: Can I use pure methanol?

A: While all components of the system are designed to be able to handle 100% pure methanol, it is not recommended for a number of reasons.

- Safety: Pure methanol is easy to ignite with a low 140F degree flash-point and burns with an invisible flame.
- Performance: Water absorbs almost twice as much heat as methanol in the intake and inside the combustion chamber. Water cannot be flash-ignited, so has what is almost an infinite octane number. In the government studies for WWII piston-powered aircraft, 50/50 water-methanol was found to be the best fluid to use for auxiliary fluid injection.

Q: Can I inject water/methanol with nitrous?

A: Yes! With nitrous, water/methanol injection allows the use of more timing advance even with large (250HP+) quantities. The cooling effect of the water/methanol inside the combustion chamber also makes for reduced peak combustion temperatures.

Q: Should I mount my nozzles pre or post turbo/supercharger?

A: • Centrifugal Supercharger/Turbo: Never mount an injector nozzle before a centrifugal supercharger or turbocharger compressor. Sending fluid through the compressor wheel that spins anywhere from 50,000rpm to 250,000rpm can erode the leading edges of the fine aluminum. Studies performed by SAAB, concluded that pre-turbo injection will over time cause cavitation on the turbo wheel leading edges.

- Positive Displacement Supercharger: Mounting the nozzle before this style of blower is perfectly safe and actually provides some additional benefits. The small amount of water-methanol fluid isn't harmful to any rotor seals or surfaces or coatings. Additionally, it keeps the rotors and housing MUCH cooler, which reduces heat transfer to the rest of the intake and air charge.

Disclaimer

Do not use this product until you have carefully read the following agreement.

This sets forth the terms and conditions for the use of this product. The installation of this product indicates that the BUYER has read and understands this agreement and accepts its terms and conditions. Performance products by their nature are designed to increase horsepower and performance not engineered in the original vehicle and the increased stress could result in damage to related systems. This is a high performance product – use at your own risk. Nitrous Express Inc., Its agents, employees or owners shall not be under any liability whether in contract or otherwise whether or not resulting from our negligence or contents of information supplied for any damage or loss resulting from such information. The **BUYER** is responsible to fully understand the capability and limitations of his/her vehicle according to manufacturer specifications and agrees to hold the **SELLER** harmless from any damage resulting from failure to adhere to such specifications. The **SELLER** disclaims any warranty and expressly disclaims any liability for personal injury or damages. The **BUYER** acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the **BUYER** agrees to indemnify the **SELLER** and to hold the **SELLER** harmless from any claim related to the item of the equipment purchased. Under no circumstances will the **SELLER** be liable for any damages or expenses by reason of use or sale of any such equipment. The **BUYER** is responsible to obey all applicable federal, state, and local laws, statutes, and ordinances when operating his/her vehicle, and the **BUYER** agrees to hold **SELLER** harmless from any violation thereof. The **SELLER** assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.