

**INSTALLATION INSTRUCTIONS
FOR PART #20012 2.0T FSI
WATER/METHANOL INJECTION
SYSTEM FOR ALL
VW AND AUDI 2.0T FSI**



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Have a question?

FAQ: www.snowperformance.net/faqs.php

 **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.

The names, addresses and telephone numbers mentioned are current as of January 1, 2010. Note that this information is subject to change. Please refer to www.snowperformance.net for current information.

Kit Contents

Parts

- UHO Pump (Ultra High Output)
- 10 ft High Pressure Tubing
- 3 ft Black Wire Loom
- 3Qt reservoir

Electrical Packet

- 1 Green LED
- 2 Blue Butt Connectors
- 2 Small Eyehooks
- 1 Wire Splice
- 1 Male Connector
- 1 Female Connector
- VC-MAF Controller With Harness
- 10 Tie Wraps

Required Tools

Electric Drill w/ Drill Bits
Utility Knife
Screwdriver – Phillips
Assorted Wrenches
1/8" - 27 NPT Tap

Mechanical Packet

- 1 Nozzle Holder
- 8 #8x1&1/2" Screws
- 8 #8 Washers
- 4 #6x1/2" Screws
- 1 Bulkhead
- 1 3/8"NPT to 1/4" tube (reservoir fitting)
- 1 E-6000® (GOOP)

Nozzles

- 60ML/MN (1)
- 100ML/MN (2)
- 175ML/MN (3)
- 225ML/MN (4)
- 375ML/MN (5)
- 625ML/MN (6)

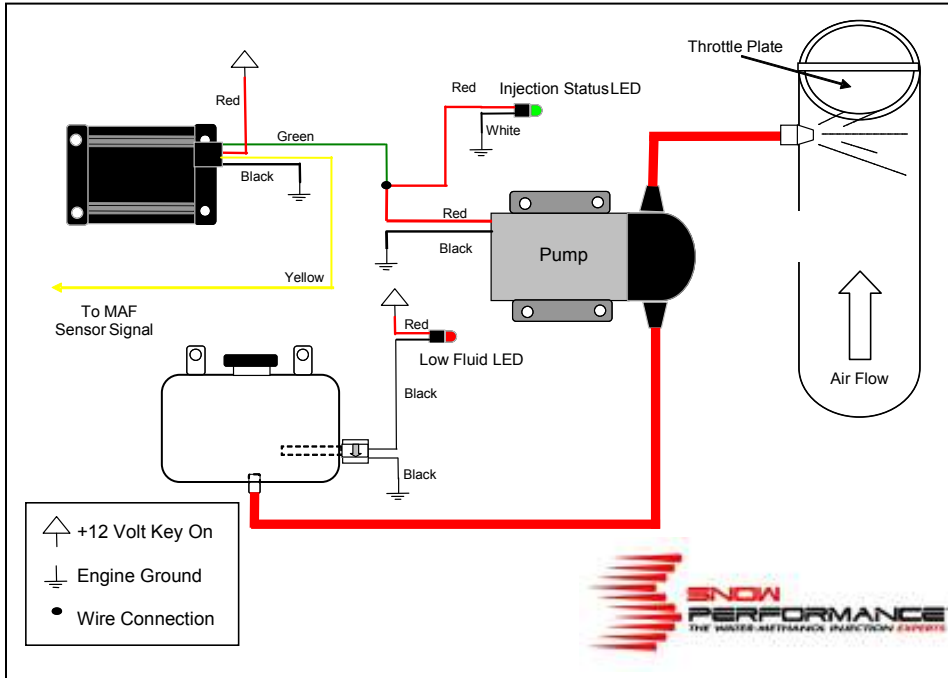
Upgrades

- 2.5 Gallon Reservoir
- Solenoid
- Hose Adaptor or Bung
- SafeInjection®
- Nitrobooster®
- Dual Nozzle
- Boost Juice
- Level Switch

Introduction

This kit has been specifically designed to work with all VW and Audi 2.0T FSI cars and their unique MAF sensors. The reservoir has been omitted and replaced by a bulkhead fitting. This fitting is used to tap into your factory windshield washer reservoir. This allows for a greater fluid capacity, a built in level sensor, and a cleaner installation. Using the washer reservoir does not defeat its originally intended use. Low Level Switch (#40035) is also shown.

Please refer to the System Diagram during installation.



Nozzle Identification Chart:

Nozzle Number	Nozzle Size	Nozzle Number	Nozzle Size
1	60 ml/min	4	225 ml/min
2	100 ml/min	5	375 ml/min
3	175 ml/min	6	625 ml/min

Contact Us:

Phone

Office

(719) 633-3811

Fax

(719) 633-3496

Tech Support Line (Toll Free)

(866) 365-2762

Web

<http://www.snowperformance.net>

Email

sales@snowperformance.net

customerservice@snowperformance.net

tech@snowperformance.net

Mail

Snow Performance, Inc

1017-A East Highway 24

Woodland Park, CO 80863

Notes

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Products returned due to damage or misuse and Products retested with no problem found will be returned to customer at customer's expense.

LIMITATION OF LIABILITY

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT IS THE ORIGINAL RETAIL PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY. DAMAGE OR INJURY TO THE ORIGINAL RETAIL PURCHASER, TO HIS OR HER VEHICLE, CARGO, OR PROPERTY, AND/OR TO ANY OTHER PERSON OR PROPERTY IS NOT COVERED BY THIS WARRANTY. THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY AND ALL OTHER EXPRESS WARRANTIES, WHETHER ORAL OR WRITTEN. SNOW'S SOLE LIABILITY IS LIMITED TO THE REMEDY SET FORTH ABOVE. IN NO EVENT WILL SNOW BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OR FOR ANY OTHER DAMAGES OF ANY KIND OR NATURE (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS OR LOST SALES). SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Non-Warranty Repair/Retest

Products returned due to damage or misuse and Products retested with no problem found are subject to repair/retest charges. Product will be returned to customer at customer's expense. A credit card number must be provided in order to obtain an RMA (Return Merchandise Authorization) number prior to returning Product.

Installation – Mechanical

Step 1 Reservoir Install

- Remove front bumper to gain access to washer reservoir.
- Drill 9/16" hole in desired bulkhead location. Note that the bulkhead can be positioned horizontally to direct the tube toward the pump.
- Remove one nut from and turn the remaining nut until it is at the very end of the bulkhead.
- Feed red tubing through the 9/16" hole and out the top of the reservoir.
- Attach red tubing to the bulkhead on the side opposite the nut.
- Pull the tube through the bulkhead hole until the bulkhead seats against the inside of the reservoir.
- Apply liberal amount of E6000® sealant around bulkhead.
- Slide the nut you had previously removed up onto the tube and thread it onto the bulkhead.
- While pulling firmly on the red tubing, tighten the outer nut using a 17mm socket (only needs to be hand tight).
- Once sealant has set, fill reservoir with water and check for leaks.



TECH TIP You can mount a tank in the rear of the vehicle. The pump is a pusher type by design so it needs to be mounted as close to the reservoir as possible. Because the pump is oversized, injection pressure will not be affected. A Solenoid Upgrade (#40060) is recommended for rear mounted reservoirs.

Step 2 Pump Install

Mount the pump so the inlet is positioned at the lowest point of the reservoir or lower. Pump can be mounted horizontally or vertically using the supplied screws and washers. Ensure that no sharp bends in the high pressure tube occur near the pump. Sharp bends can cause stress on the inlet and outlet ports of the pump, causing leaks. Trim tube with a utility knife or razor blade, making sure to eliminate any burrs or kinks on the end. Insert firmly into the pump about ½ inch through the light grey locking collar. Note the arrows indicating flow direction on the top of the pump. To remove the hose, gently and evenly push the light grey locking collar into the head unit of the pump, then pull on the hose gently.



Mount pump away from direct road spray and debris.

Measure the distance from the reservoir outlet to the pump inlet. Cut the ¼" red tubing using utility knife. Make cuts are as square as possible.

Ensure there are no kinks in the tubing and insert tubing into quick disconnects at pump and reservoir until fully seated. Keep the pump within 2 feet of the reservoir.

Warranty

Warranty Policy

Snow Performance, Inc. warrants that the Product shall conform to and perform in accordance with published technical specifications and shall be free of defects in materials and workmanship for 90-days providing:

1. You are the original purchaser and provide proof of purchase.
2. For 1-year warranty, the Warranty Card that came with system (not applicable to separate parts purchases) is returned to Snow within 45-days of purchase. If valid warranty card not on file with Snow, the standard 90 day warranty applies from date of purchase.
3. For Lifetime warranty, the Warranty Card that came with system (not applicable to separate parts purchases) is returned to Snow within 45-days of purchase and Boost Juice® injection fluid is used exclusively.*
3. An RMA # has been attained and is displayed on package containing returned part.
4. Parts Warranty ~ 90 day warranty on parts purchased separately if used in conjunction with a Snow System. No warranty implied if used with a non-Snow part/system.

Subject to Snow's inspection of the product, Snow will remedy defects in materials and/or workmanship by repairing or replacing, at Snow's option, the defective product without charge for parts or labor, subject to the limitations and exclusions described in this warranty.

This warranty does not cover problems caused by normal wear and tear including aesthetic oxidation of surfaces, accidents, unlawful vehicle operation, or modifications or repairs to product not performed or authorized by Snow. This includes any product that is disassembled or taken apart for any reason.

* Boost Juice® usage evidenced by invoices/ receipts.

In addition, this warranty does not cover problems resulting from conditions beyond Snow's control including, but not limited to, theft, misuse, overloading, or failure to assemble, mount or use the product in accordance with Snow's written instructions or guidelines included with the product or made available to the original retail purchaser.

In the event of failure, Snow will repair or replace the part at Snow's sole discretion. Failures resulting from misapplication or misuse of the Product, failure to adhere to any specifications or instructions, or failure resulting from neglect, abuse, accidents, or act of nature are not covered under this warranty.

Warranty service may be obtained by calling 719-633-3811, getting an RMA (Return Merchandise Authorization), delivering the part to Snow along with proof of purchase. Customer agrees to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges to Snow, and to use the original shipping container or equivalent. Shipping for Warranty replacement parts shipped outside the continental US will be charged to customer.

Non-Warranty Repair/Retest

Install Notes

Pump Setting _____(psig)

Nozzle Size _____(ml/min)

Boost / Vacuum setting _____

Misc:

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. Snow Performance 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.

Step 3 Nozzle Selection

Nozzle sizing is a function of horsepower, which approximates the engine airflow, and boost, which approximates intake charge heat.

The following are general guidelines:

Stock – 200 WHP:	175ml/min nozzle.
200 - 250 WHP:	225ml/min nozzle
250+ WHP:	375ml/min nozzle

TECH TIP Seal the nozzle into the nozzle holder using included GOOP® sealant. Using a sealant that is not permanent will allow for nozzle changes during tuning. Simply remove the nozzle, clean the threads, and reinstall using sealant.

Assemble desired nozzle into nozzle holder using E6000® sealant. **The end of the nozzle with the fine mesh screen is to be inserted into the nozzle holder.** Torque 1/2 turn past finger tight. Do not use Teflon sealants on Snow Performance fittings.



Correct



Incorrect

NOTE: If nozzle is mounted lower than the reservoir, a Solenoid Upgrade (#40060) must be used to prevent draining.

Step 4 Nozzle Mounting

The nozzle assembly should be installed 90° to the direction of airflow. On round intake tubes, this is 360° around the tube meaning the nozzle can be mounted in any direction. This will ensure maximum cooling as the nozzle sprays in a cone pattern. The nozzle should be the highest point in the system, and its tip should be flush with the inside wall of the tube or projecting slightly into the airflow to ensure good spray pattern.

Drill and tap (11/32" pre-drill, 1/8"-27 NPT tap) air inlet tube as close as possible to throttle body/throttle plate.



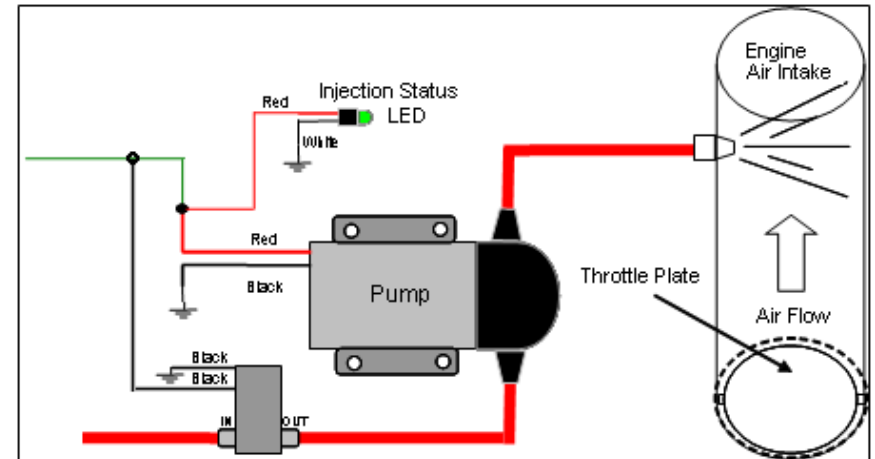
The nozzle is mounted using its external 1/8 NPT threads. Tighten the nozzle and nozzle holder assembly one half turn past finger tight using E6000® to seal the threads.

You can mount the nozzle in a plastic or rubber air inlet tube using a Nozzle Mounting Adapter (#40110).

TECH TIP The typical nozzle mounting point is before the throttle body/plate. If you mount the nozzle after the throttle body/plate, a Solenoid Upgrade (#40060) must be used to prevent siphoning at idle.

Solenoid Upgrade (optional)

The optional Solenoid Upgrade (#40060) is required if the nozzle is to be installed after the intake throttle plate (as shown), or the fluid reservoir is mounted higher than the nozzle. It is highly recommended for trunk-mount reservoirs.



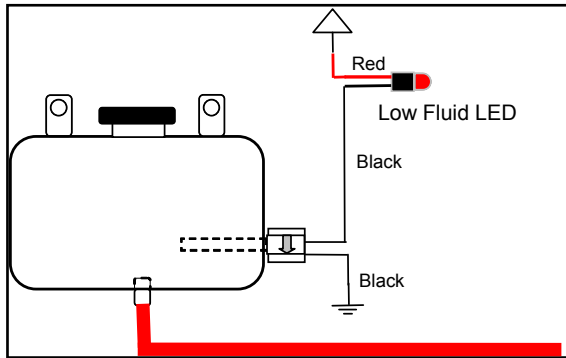
Finger thread the two 1/8" NPT quick connect fittings into ports labeled (2 or IN) and (1 or OUT) on the solenoid. Tighten an additional half turn past finger tight.

Note: Solenoid must be installed Pre-pump to ensure correct operation.

Cut high pressure line at location solenoid is to be installed. Insert ends of cut line into quick connect fittings of solenoid. The port labeled (2 or IN) is the inlet and the port labeled (1 or OUT) is the outlet. Gently pull on line to check secure connection. If line pulls out, re-insert farther into fitting to engage locking clips. If high pressure line removal is required, firmly press in metal fitting ring to disengage locking clips while pulling hose from fitting.

Connect one of the BLACK wires from solenoid to the RED positive pump wire or the WHITE wire from the controller. Note that connecting the wire to any other power source other than the pump/controller wire will result in improper operation of solenoid. Connect the second BLACK wire to a secure chassis ground location.

Fluid Level Switch (optional)



Instructions

- Locate desired level switch mounting position. Suggested placement is 1/5 of max reservoir height.
- Carefully drill side of reservoir using 13/16" bit. A step bit is recommended for best drilling results. Hole must be free of nicks or shavings for proper sealing.
- Remove rubber seal from level switch. Insert seal into reservoir until fully seated. Goop can be used around the edges of the hole.
- Lubricate exterior of level switch with water and insert into seal until fully seated. Position level switch so **GT** symbol is at six o'clock position.
- Wait 30 minutes for Goop to cure, then test for leaks. With fluid level above level switch, float should be angled up. With fluid level below level switch, float should be in horizontal position.
- Connect one black wire from level switch to ground.
- Connect other black wire from level switch to white wire from LED.
- Connect red wire from LED to +12 volt key on power source.



Step 5 Nozzle Connection

Measure the distance from the pump outlet to the nozzle holder. Cut the 1/4" tubing using utility knife. Make cuts are as square as possible.

Ensure there are no kinks in the tubing and insert tubing into quick disconnects until fully seated. Gently pull on tubing to ensure a good connection.



Nozzle mounted in charge pipe.

Use tie wraps to help route tubing and to ensure it doesn't contact moving or hot parts in the engine compartment. Have tubing connect to quick connect fittings at shallow angles. Having an immediate sharp bend may unseat the tubing from the internal o-ring and create a leak.

Continual insertion and removal from quick connect fittings will mar the end of the tubing. Over time the internal gripping teeth may lose their hold of the tubing which may create a leak. If this occurs simply remove the tubing and make a fresh cut using a razor blade.

Installation - Electrical

Variable Controller Installation



Attach controller to secure location with easy access in engine bay or passenger compartment. The VC series controllers are designed to withstand engine bay conditions, but should not be mounted directly to the engine block.

⚠ CAUTION: Disconnect the negative battery terminal while connecting wires to prevent electrical fire or damage to controller.

- Connect BLACK wire to a good ground location.
- Connect GREEN wire to Pump RED power wire.
- Connect RED wire to +12V key on source. When selecting a 12 volt key-on source, try to find a dedicated circuit fused for 10-15 amps.
- Connect YELLOW wire to the signal wire from MAF to ECU. Use the yellow wire from MAF sensor on most Volkswagen vehicles. Use purple wire on most Audi vehicles.

TECH TIP Always have a good electrical ground connection. Poor ground will result in erratic operation of controller.

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 Boost Cooler® adds an alternate fuel source as well as significantly cools combustion. With the Boost Cooler®, 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.

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 it is coming on 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 at least once per year using carb cleaner.

The Boost Cooler® has been designed to operate with high concentrations of methanol. Oil or other additives are not required for system lubrication.

For best performance, cooling and system life it is recommend that Snow Performance Boost Juice™, part #40008, be the exclusive fluid used in the system.

Step 2 Test Controller

- Begin the testing process with both dials on the VC-MAF at their highest settings (clockwise).
- Turn ignition key on so that the system has 12 volt power. If the pump runs, inspect ground wires for secure connection and repair as needed.
- The pump should be off at this point, start vehicle. Slowly turn the Start dial lower (counter clock wise) until the pump activates. If the lowest setting is reached without pump activating, it may be necessary to rev engine to increase airflow signal to the controller. Turn Start dial back up (clockwise) until pump shuts off.

Setting the MAF Sensor Type

The VC-MAF controller is designed to work with all different types of vehicle MAF sensors. A four position switch located inside the VC-MAF allows the selection of the MAF sensor type. The VC-MAF reads the selection switch on power up to determine the mode of operation. The switch selection can be changed at any time, but power to the VC-MAF needs to be cycled before the new selection will be used.

To access the MAF selector switch, remove the plastic plug located under the wire harness on the front of the VC-MAF. The default setting is all switches in the OFF or UP position. **2.0T FSI vehicles use SWITCH 3 ON.**

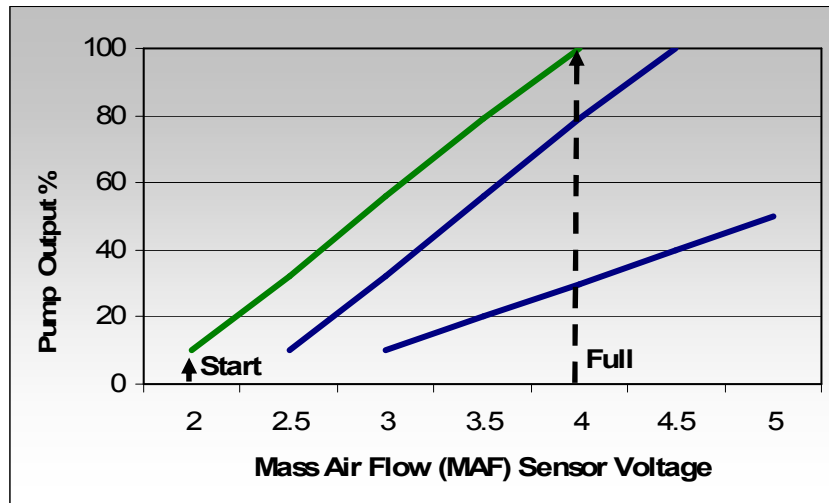
ON	OFF	OFF	OFF	Mitsubishi/Dodge (DSM etc)
OFF	ON	OFF	OFF	1993 and Older GM (Low HZ MAFs)
OFF	OFF	ON	OFF	FSI Engines
OFF	OFF	OFF	ON	0-5V Hotwire MAFs (Ford, Toyota, 1.8T VW etc.)

Note: Only one switch can be in the ON or DOWN position at a time.

Variable Controller Tuning

- Adjust the START level first by turning dial to approximately the 12:00 position. This sets the Air Flow sensor frequency required to activate the injection system. If quench is experienced early in injection increase this point until it is eliminated.
- Next, adjust FULL level to the 'D' position.
- Note - over lapping the settings, where the FULL dial is lower then START, will result in max injection at the onset point.
- Road test vehicle and adjust FULL dial until a smooth power curve is felt with no misfiring. Often the full dial can be set lower than the maximum output level of the MAF for greater cooling with no misfiring. If misfiring is experienced, set the full dial higher until it is eliminated

Controller Operation Example



For setting 1, left, the chart shows the Start dial at 2 volts and the Full dial at 4 volts. At 2 volts from the MAF, the pump will operate at 10%. At 4 volts from the MAF, the pump will deliver 100% of injection pressure.

For MAF voltage readings between the Start and Full settings, the controller will linearly adjust the pump output as shown on the graph. Note the HZ values associated with the voltages on the front face of the controller. They provide a map of where injection will start and reach full volume.

Example:

For a mildly modified 2.0 FSI, begin with the full dial at the 'D' position. Set the start dial at the 12:00 position. If the car runs well during WOT runs with no bogging or miss-fires, gradually try lower start settings. It is not recommended that injection start in excessively low throttle situations, such as in normal acceleration from a stoplight. After setting the start dial, slowly try lower full dial settings. Often the full dial can be set much lower than the maximum MAF output. If bogging or miss-fires are experienced, turn the full dial back to a more conservative setting until the car pulls smoothly at all RPMs. Typically a modified 2.0FSI will have a start setting at approximately the 11:00 position and a full setting at approximately the 1:30 position, with a 175 or 225 nozzle.

Testing the System

Note: for best results, prime pump before use

To clear air from the pump and insure that the system is primed:

- Fill reservoir with water approx ¼ full.
- Remove tubing from nozzle (or solenoid if solenoid used in-line between pump and nozzle) and run tube into separate container.
- Apply 12 VDC to red pump wire for approximately 5 seconds or until fluid flow is consistent.
- Pump is now primed. Reconnect tubing from pump outlet to nozzle (or solenoid).

Step 1 Test Pump and Mechanical System

Disconnect all control and SafeInjection® modules. Disconnect tube from the outlet port of the pump. Using a 12 volt source, apply power to red wire of pump. Pump should activate, green LED should go on, and fluid level in tank should go down. It is recommended to also check the nozzle spray pattern while following this procedure. Also check for leaks. Never flow liquid through a SafeInjection® module without all nozzles connected.



If pump goes on and fluid level doesn't go down, there is an obstruction in the tube or nozzle. Activation of the pump for short intervals will purge air from the system after installation. This can be accomplished during initial use.