

# **BOOST COOLER™**

**INSTALLATION INSTRUCTIONS  
FOR PART #20020 MC/MC2/DOM  
WATER / METHANOL INJECTION  
SYSTEMS  
NATURALLY ASPIRATED  
/CARBURETED**



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## CONTENTS

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Contents	3
Introduction	4
Installation – Mechanical	5
Installation – Electrical	11
Tuning the System	12
Testing the System	14
Tuning Quick Reference	16
Maintenance	16
Fluid Level Switch	17
Installation Note/Disclaimer	18
Warranty Information	19
Contact Us	21

Have a question?

FAQ: [www.snowperformance.net/faqs.php](http://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.

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## Kit Contents

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### Parts

- UHO Pump (Ultra High Output)
- 3 Qt Reservoir
- 10 ft High Pressure Tubing
- 3 ft Black Wire Loom
- 18" 1/8" Silicone Tubing
- Carburetor Plate (2 Plates for MC2)
- Solenoid Upgrade

### Electrical Packet

- 1 Green LED
- 2 Blue Butt Connectors
- 1 Wire splice
- 1 Large Eyehook
- 1 Small Eyehook
- 1 Male Connector
- 1 Female Connector
- 1 Vacuum "T"
- MCVK Controller With Harness
- 10 Tie Wraps
- Level Switch Upgrade

### Required Tools

Adjustable Wrench  
Utility Knife  
Screwdriver – Phillips®  
5/16" Open End Wrench

### Mechanical Packet

- 1 Nozzle Holder
- 1 Reservoir Fitting 3/8 NPT to 1/4" tube
- 8 #8x1&1/2" Screws
- 8 #8 Washers
- 4 #6x1/2" Screws
- 1 E-6000 (GOOP)
- Dual Nozzle Upgrade (MC2 Only)

### Nozzles

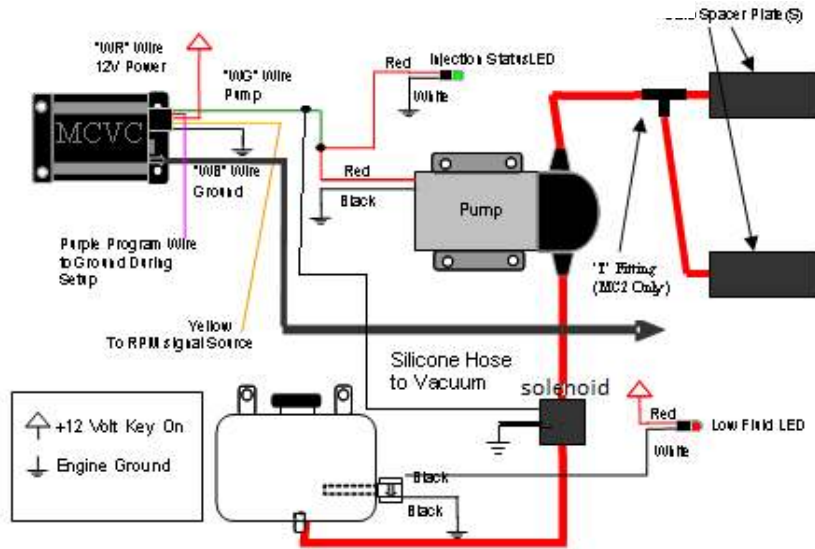
- 60ML/MN (1)
- 100ML/MN (2)
- 175ML/MN (3)
- 225ML/MN (4)
- 375ML/MN (5)
- 625ML/MN (6)

### Upgrades

- Bulkhead
- 2.5 Gallon Reservoir
- SafeInjection®
- Nitrobooster®
- Dual Nozzle
- Boost Juice

## Introduction

- Please refer to system diagram during install. The Level Switch Upgrade (#40030) is shown.



## 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

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## Notes

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The names, addresses and telephone numbers mentioned are current as of January 1, 2009. Note that this information is subject to change. Please refer to [www.snowperformance.net](http://www.snowperformance.net) for current information.

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## 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.

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## Installation – Mechanical

### Step 1 Reservoir Install

Install the reservoir fitting with a small amount of E6000® sealant and mount reservoir in engine compartment using #8x1½" sheet metal screws and washers provided. Note that the nozzle(s), not the reservoir, should be the highest point in the system.



**Optional:** The factory windshield washer reservoir can be used as the reservoir for your system with the optional bulkhead fitting. (PN# 40080)

- Drill 9/16" hole in desired bulkhead location. Note the bulkhead can be installed horizontally to direct tube toward pump.
- Remove one nut from bulkhead and turn the remaining nut to the end.
- Feed red tubing through the drilled hole and up and out of the top of the reservoir.
- Attach tubing to the bulkhead on the side opposite the nut.
- Pull the tubing through the bulkhead hole until the bulkhead seats against the inside of the reservoir.
- Apply E6000® sealant (included) around bulkhead.
- Slide the nut you had previously removed up onto the tube and thread onto bulkhead.
- While pulling firmly on the red tubing, tighten the outer nut using a 17mm socket (only needs to be hand tight). A ratchet is not needed.
- Once sealant has set, fill reservoir with water and check for leaks.

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## Caution\*\*\*\*\*

To avoid gravity feeding of fluid with rear mount reservoirs, it is essential to use a check valve in-line between the reservoir and pump. **Do not operate** your rear mount equipped vehicle without a check valve installed.

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## Caution\*\*\*\*\*

Whenever the nozzle is mounted post-throttle plate, to avoid siphoning fluid at idle, it is essential to use a solenoid upgrade inline between the reservoir and pump.

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### 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.

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## 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

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

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## 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.



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.

### Caution\*\*\*\*\*

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

### Step 3 Nozzle Selection

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

Recommended starting points:

#### MC/DOM (Single Carburetor Plate):

250 - 350 RWHP:	100ml/min nozzle.
350 - 475 RWHP:	175ml/min nozzle
475 - 800 RWHP	375ml/min nozzle

#### MC2 (Double Carburetor Plates):

350 - 500 RWHP:	2 X 100 ml/min nozzle.
500 - 925 RWHP:	2 X 175 ml/min nozzle
925+ RWHP	2 X 225 ml/min nozzle

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.



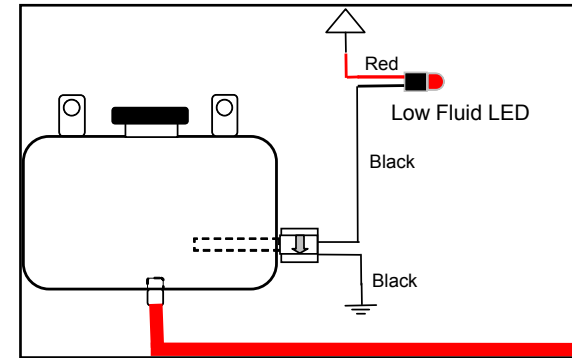
Correct



Incorrect

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

### Fluid Level Switch



#### 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.





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## Tuning Quick Reference

The power potential of the system is realized through increased 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).

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### Caution\*\*\*\*\*

Prolonged quench may cause lower engine damage over a period of time.

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**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.

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## Step 4 Nozzle Mounting

This system uses the carburetor spacer plate(s) to mount the nozzle(s). Note that there are two ports for the nozzle on each plate. Use either one, and block the other with a 1/8" NPT plug (available at any hardware store) or use it as a boost reference point. Be sure to use a small amount of E6000® sealant to ensure a leak free installation of the nozzles. In high powered single carb applications over about 1400HP, two nozzles may be required on a single plate. A single nozzle will be able to evenly distribute water-methanol to all cylinders due to the ultra-fine atomization and high pressure the system provides.

Note also that the spacer plates include fresh gaskets and long studs to allow use with a 4150 or 4500 style carburetor and manifold and a clean installation.

## Step 5 Solenoid Mounting

The solenoid will prevent any siphoning of fluid under vacuum (such as at idle). It has two ports, labeled 2 (inlet) and 1 (outlet). Using a small amount of E6000® sealant, install the included fittings into these ports. Torque to one half turn past finger tight.

The solenoid must be in-line between the pump and the nozzle(s) to operate properly. Typical mounting locations are on the firewall. The "2" port is on the pump side and the "1" port is on the nozzle side of the solenoid.

The solenoid features two black wires. One of these connects to the green wire of the controller harness. The other goes to ground. It is not important which wire goes to which place.

### **Single Carb:**

Connect hose from the "1" port of the solenoid to the nozzle holder.

### **Twin Carb:**

Connect hose from the "1" port of the solenoid to the 'T' fitting. Connect hose from the 'T' fitting to each nozzle holder. (See installation diagram)

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## Step 6 Nozzle Connection

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Measure the distance from the solenoid (single carb MC/DOM) or 'T' fitting (twin carb MC2) to the nozzle holders. 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.

**Note the shallow angle of the tube to the nozzle holder.  
(Carburetor plate not shown, optional weld-in  
bung installed on tube.)**



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.

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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.

## Step 2 Test Controller

With the nozzle removed from intake, start vehicle and let it idle for 10 seconds. Set the rpm switch with the motor at 1500. Increase engine RPM above 1500 rpm and remove the vacuum line from the controller. The controller is now detecting atmospheric pressure which is the same condition as wide open throttle. The pump should activate, green LED should go on, and the fluid level in tank should go down. If system does not activate, check all wiring connections.

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## 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).

**If using a check valve in between the pump and the reservoir:**

Remove the check valve and place a solid piece of tube between the pump and the reservoir and prime the system. Then replace the check valve in between the pump and reservoir.

### Step 1 Test Pump and Mechanical System

Electrically disconnect all control and SafelInjection® 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 SafelInjection® module without all nozzles connected.



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## Installation - Electrical

### Variable Controller Installation



The figure above shows the MCVV controller layout. 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. Connect vacuum hose from intake manifold to hose barb on front of controller. Note the white lettering and colored bands on two of the three black wires on the controller.

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

- Connect the Black wire labeled “WB” to a good ground location.
- Connect the wire labeled “WG” to Pump Red power wire. The wire will have a green band on it near the front face of the controller.
- Connect wire labeled “WR” to +12V key on source. When selecting a 12V key-on source, try to find a dedicated circuit fused for 10-15 amps. The wire will have a red band on it near the front face of the controller.
- Connect YELLOW wire to low voltage side (-) of primary ignition coil or engine tachometer signal wire. Ignition auxiliary tachometer outputs are ideal. Many aftermarket ignitions (MSD, etc) have 12V outputs for tachometers that are ideal.
- PURPLE wire is only used during initial setup, and then can be tied out of the way.

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

## Calibrating RPM Switch

The MCVC has an internal RPM switch that is programmable. This feature sets the minimum RPM required to enable injection. The RPM switch can be programmed at any time with the following steps:

- Start engine and wait 5 seconds for controller power up delay.
- Rev engine to desired minimum injection RPM point and hold throttle position constant. Below this RPM, the system will not inject.
- Press and hold PURPLE wire on the controller to ground for 5 seconds. During this time controller will sample RPM signal and save reading to internal memory.

The factory programmed RPM point of the MCVC is beyond normal vehicle range and MUST be set during install per above procedure before injection will occur. If stuttering or bogging occurs at the onset of injection, you may need to increase the RPM point.

## Variable Controller Tuning

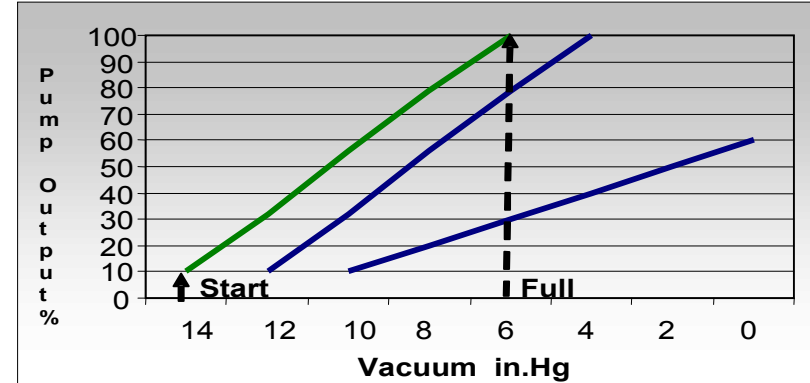
The MCVC has a built in 5 second power up delay. This feature helps prevent injection during engine starting.



The MCVC is designed to control injection based on engine load. Once the RPM switch is calibrated, the controller will activate injection based on vacuum whenever the engine RPM is greater than the calibrated RPM.

- Adjust the "Start" point first by turning dial clockwise to about one third of the engine's max vacuum. This sets the vacuum pressure required to activate the injection system. If stuttering or bogging occurs at the onset of injection, increase the RPM point or the Start dial point.
- Next, adjust "Full" to the engines minimum vacuum, usually 0.
- It may be possible to set the full point at a point before 0 for more aggressive injection.

## Controller Operation Example



The above chart plots three different settings for the MCVC water/methanol injection controller

For setting 1, left, the chart shows the Start dial at 14 in. Hg and the Full dial at 6 in.Hg. At 14 in.Hg of manifold vacuum, the pump will operate at 10% injection output. At 6 in.Hg of manifold vacuum, the pump will deliver 100% of injection pressure.

For manifold vacuum readings between the Start and Full settings, the controller will linearly adjust the pump pressure as shown on the graph.

### Example:

**On a vehicle that idles at 15 inches of vacuum and cruises at approximately 7 inches, we will start injection at about 4 inches of vacuum. The full dial will be set at 1 inch of vacuum. The minimum RPM should be set to 3000 to avoid any bogging. This will allow the system to inject under moderate throttle conditions, with injection increasing as engine load increases.**